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TREATMENT OF ACUTE NEPHRITIS

THE IMMEDIATE RESULTS AND THE OUTCOME TEN YEARS LATER IN EIGHTY-NINE CASES

FRANCIS D. MURPHY, M.D.
AND
BRUNO J. PETERS, M.D.
MILWAUKEE

If the problem of acute nephritis were limited in its scope to the acute episode, the subject would be a comparatively simple one. But this is not the case. While it is not unanimously believed that chronic glomerular nephritis evolves from an unhealed acute attack, this is an opinion widely held. During the past ten years observations by many investigators [1] have been made on the relationship of the acute phase to the chronic form, and there seems to be sufficient evidence to substantiate the assumption that chronic glomerular nephritis is a remote consequence of acute nephritis which failed to heal completely.

There are many obstacles in establishing the proper correlation between the acute and the chronic stage of nephritis. Among them is the difficulty of convincing the patient of the need of reexamination in the years after the acute phase is over and before symptoms of chronic nephritis begin. During the period of transition between the acute and the chronic stage the patient may appear and feel well and no medical attention may be considered necessary, yet the nephritis may be gradually destroying the renal units. Then too the physician who sees the patient years later, when the chronic form sets in, is apt not to be the one who studied him in the initial period of the disease. This is particularly true when acute nephritis occurs in children.

Not until recent years have methods been devised to determine the presence of a minimal unhealed lesion in the kidney. Before the method of Addis [2] was employed and prior to the use of such tests as determination of the sedimentation rate of the erythrocytes and the blood urea clearance test, the presence of latent nephritis was largely overlooked. It is in the latent or transitional period, when the patient appears normal and seems cured but in fact is not, that the key to the correlation between acute and chronic nephritis is found.

In the last decade the number of after-studies of patients with acute nephritis has been growing steadily. These observations have been responsible to a large extent for the modern concept of acute nephritis, which is that not all the classic syndromes of hematuria, edema, hypertension and albuminuria are required before a diagnosis of acute nephritis can be made. Milder forms are being recognized and treated adequately in an increasing number of cases. Simple methods have been devised which aid greatly in determining whether the renal lesion has healed or is remaining active after the acute phase is supposedly over.

In reports dealing with the ultimate prognosis of acute nephritis great divergence of opinion is shown. Some authors [3] have reported that complete recovery is the usual course, with chronic glomerular nephritis following only rarely, while others [4] have expressed the belief that chronic nephritis is a fairly common consequence in later years. How statistics may vary in this regard is shown by Snoke [5] in his follow-up study comparing the prognosis in a series of cases at Stanford University School of Medicine with that in a series at the University of Rochester School of Medicine and Dentistry.

ANALYSIS OF THE PRESENT SERIES

Our report is concerned with 205 patients with acute nephritis studied in the initial stages at the Milwaukee County Hospital and kept under observation for two to ten years afterward. The series includes both adults and children who were studied in the hospital for three months to a year and were observed at regular intervals at the outpatient clinic during the years that followed.

Our interest was focused particularly on 89 patients who recovered from the intial stage of acute nephritis satisfactorily but continued to have evidence of activity

From the Department of Medicine, Marquette University School of Medicine, and the Clinics, Milwaukee County Hospital.

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1. Murphy, F. D., and Rastetter, J. W.: Acute Glomerular Nephritis, with Special Reference to the Course and Prognosis: A Study of One Hundred and Fifty Cases, J. A. M. A. **111:** 668 (Aug. 20) 1938. Snoke, A. W.: Stages, Prognosis and Duration of Glomerular Nephritis in Childhood, Am. J. Dis. Child. **53:** 673 (March) 1937. Cass, J. M.: The Ultimate Prognosis of Nephritis in Childhood Together with a Study of the Incidence of Anemia in the Various Stages of the Disease, Arch. Dis. Childhood **14:** 137 (June) 1939. Osman, A. A.: Studies in Bright's Disease: XII. The Late Results of Acute Nephritis in Soldiers and Civilians, Guy's Hosp. Rep. **86:** 93 (Jan.-April) 1936.

2. Addis, Thomas: A Clinical Classification of Bright's Disease, J. A. M. A. **85:** 163 (July 18) 1925.

3. Tallermann, K. H., and Burkinshaw, J. H.: Prognosis in Acute Nephritis in Childhood: Further Note, Lancet **1:** 1256 (June 3) 1939. James, R. F.: The Prognosis of Nephritis in Childhood, J. A. M. A. **76:** 505 (Feb. 19) 1921. Guild, Harriet G.: The Prognosis of Acute Glomerular Nephritis in Childhood, Bull. Johns Hopkins Hosp. **48:** 193 (April) 1931. Aldrich, C. A., and Boyle, H. H.: Chronic Nonspecific Nephritis: Clinical Observations on Forty Children, with Results of Treatment on Full Diets, J. A. M. A. **100:** 1979 (June 24) 1933. Blackfan, K. D.: Acute Nephritis in Children, with Special Reference to the Treatment of Uremia, Bull. Johns Hopkins Hosp. **39:** 69 (Aug.) 1926.

4. Murphy, F. D.; Grill, J., and Moxon, G. F.: Acute Diffuse Glomerular Nephritis; Study of Ninety-Four Cases with Special Consideration of the Stage of Transition into the Chronic Form, Arch. Int. Med. **54:** 483 (Oct.) 1934. Addis, Thomas: Haemorrhagic Bright's Disease: Prognosis, Etiology and Treatment, Bull. Johns Hopkins Hosp. **49:** 271 (Nov.) 1931. Osman, A. A.: The Aetiology and Prognosis of Acute Nephritis in Children and Young Adults: I. A Clinical Study of Fifty-Six Cases, Guy's Hosp. Rep. **75:** 306 (July) 1925. Hume, W. E., and Nattrass, F. J.: The Late Effects of War Nephritis, Quart. J. Med. **21:** 1 (Oct.) 1927. Cruickshank, J. N.: Prognosis in Nephritis, Glasgow M. J. **124:** 184 (Oct.) 1935. Richter, A. B.: Prognosis in Acute Glomerular Nephritis, Ann. Int. Med. **9:** 1057 (Feb.) 1936.

5. Snoke, A. W.: Prognosis in Glomerular Nephritis in Childhood, Am. J. Dis. Child. **57:** 1373 (June) 1939.

of a renal lesion for months afterward. After discharge from the hospital, these patients were readmitted for study at regular intervals when it was thought advisable. Check-up examination included daily urinalysis of the twenty-four hour specimen, examinations of the urinary sediment by the method of Addis, blood urea clearance tests, determinations of the sedimentation rate, blood cell counts and determination of the blood pressure twice daily.

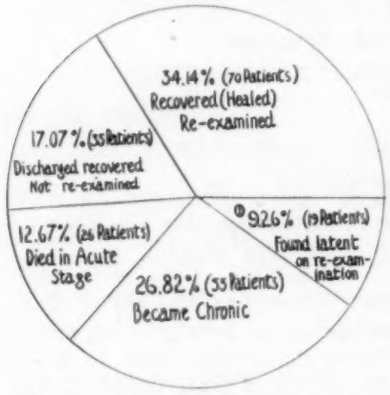

Chart 1.—Outcome in 205 cases of acute nephritis studied during a ten year period.

Of the 205 patients studied, the disease of 55, or 26.8 per cent, became chronic, and 26, or 12.6 per cent, died in the acute stage or later (chart 1). Thirty-five, or 17 per cent, although clinically cured at the time of discharge, did not return for reexamination, but we assume rightly or wrongly that they remained in the state of recovery. The patients who died in the acute stage and those whose disease became chronic within a year, as well as those who did not return for reexamination having been eliminated, there are 89 whose careful follow-up study is the chief topic of this paper.

Forty-one, or 46 per cent, of these 89 patients were considered cured, but 6 later showed evidence of latent nephritis (charts 2 and 3). Forty-eight, or 53.9 per cent, had some evidence of renal inflammation (latent nephritis) at the time of discharge. Thirteen, or 27 per cent, of these continued to have latent nephritis. Fifteen had an excessive number of red blood cells in the urine. A follow-up study of these 15 showed that eventually 10, or 66.6 per cent, were healed completely and that the remaining 5, or 33.3 per cent, continued to have evidence of an active renal lesion. Of the group of 48, 18 were dismissed from the hospital with both albumin and an excessive number of red blood cells in the urine. Four, or 22.2 per cent, of them continued to show an active renal lesion. Fifteen of the 48 were discharged with a trace of albumin but no red blood cells or casts in the urine, and 4 of these, or 26.6 per cent, continued to show activity of the renal lesion. Therefore, when the ultimate result in the 205 patients is considered, there were 70 patients, or 34.1 per cent of the total series, with complete recovery, and 19, or 9.2 per cent, found on reexamination to have latent nephritis. Thirty-five, or 17 per cent, were discharged as completely cured but failed to return for reexamination. If these figures are corrected and the patients not returning for examination are excluded there is an amended figure of 41 per cent for patients completely healed. If the patients with chronic and those with latent nephritis are grouped approximately 36 per cent have an unhealed renal lesion. Also, if this figure is corrected to exclude the patients not returning for examination, a resulting 43.5 per cent of our patients still have an active lesion.

Age and Sex Distribution.—The age and sex distribution in 89 cases of acute nephritis is given in table 1 and chart 4, and this distribution is made the object of a special study in table 2, in which 19 patients with nephritis in the latent stage are compared with the 70 cured patients who had acute nephritis. In our series 58 patients were male and 31 female. Of the 19 patients with latent nephritis 14 were male and 5 female. From table 1 it may be seen that most of our patients were adults, and in the greatest number the disease occurred between the ages of 10 and 20 years. In 14 it occurred between the ages of 20 and 30 and in 14 others between 30 and 40. It may be seen in table 2 that latency predominated in the group of patients aged from 10 to 20 years.

Etiology.—In tables 3 and 4 the diseases that preceded the acute nephritis in the 89 cases are listed. As in almost all other reports, infections of the upper respiratory tract constituted the chief offender. As far as we could make out, the type of preceding acute infection had little or nothing to do with the prognosis. Sometimes acute nephritis comes on within a few days of the onset of the preceding disease, but most often the first evidence of nephritis develops from seven to fourteen days after the onset of the acute infection. The period of lapse between the onset of the acute disease and the occurrence of nephritis appears to make little difference in the ultimate outcome.

THE CLINICAL COURSE

No attempt was made to classify our cases into various groups according to the intensity of one clinical feature or another. We believe that there is but one acute nephritis and that there is no advantage in further subdividing the series. Acute nephritis may develop abruptly, displaying all the classic textbook features, such as hypertension, edema and hematuria, or it may come on so insidiously that it may escape notice entirely unless the urine is examined and evidence of renal involvement found. The mild type seems innocent at first, but the benignity is more apparent than real, for the ultimate outlook for the patient with mild nephritis is no better than that for the patient with a more severe form of the disease.

The clinical manifestations of acute nephritis may be few or many. In our study we have classed these clinical features in five main syndromes and have studied them routinely in each case. They are (*a*) the urinary syndrome, (*b*) edema, (*c*) hypertension, (*d*) retention of nitrogenous products in the blood and (*e*) uremia, genuine or convulsive. These syndromes all may be present in a patient at the same time, or one syndrome may occur, dominate the clinical picture for a brief period and then disappear entirely, only to return at a later period or perhaps never to return. In table 5 the various syndromes are listed and the combination of them appearing in the 89 cases is given. The number of times that each syndrome occurred is incorporated in table 6.

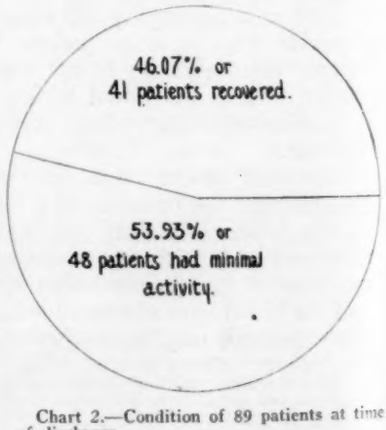

Chart 2.—Condition of 89 patients at time of discharge.

(*a*) *The Urinary Syndrome.*—The urinary syndrome occurred alone in 25 instances and it was present in every one of the 89 cases. A simple, careful study of the urinary syndrome is without doubt most important, because its significance is least likely to be misinterpreted and it is present in every case. The occurrence of the urinary syndrome alone is worthy of more

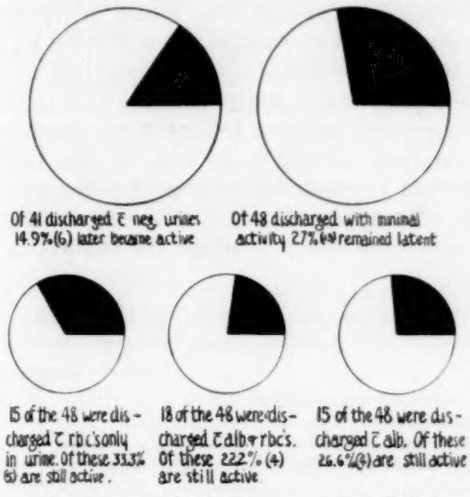
Of 41 discharged ♂ neg. urines 14.9%(6) later became active
Of 48 discharged with minimal activity 27%(13) remained latent
15 of the 48 were discharged ♂ rbc's only in urine. Of these 33.3% (5) are still active.
18 of the 48 were discharged ♂ alb + rbc's. Of these 22.2% (4) are still active
15 of the 48 were discharged ♂ alb. Of these 26.6%(4) are still active

Chart 3.—Data on urine in 89 cases at time of discharge.

thought, because often the examination of the urine is neglected unless other evidences, such as hypertension, edema and hematuria are found. Some cases of acute glomerular nephritis have been reported [6] in which albuminuria was absent for a time after other evidences, such as hypertension and edema, appeared. We did not observe such cases in this series.

(*b*) *Edema.*—Although edema in acute nephritis may result from heart failure as well as from the nephritis, our figures for the incidence of edema in acute nephritis refer entirely to renal edema and not to the kind that comes from heart failure. Edema marks the onset of acute nephritis in some cases. Its importance lies to a large extent in the fact that it serves to bring to the attention of the medical attendants of the patient the possibility of a renal lesion or involvement of the kidney. Although some observers look on edema as a grave sign, usually it is innocent. We failed to find that patients with edema fared worse than patients without it. This statement does not hold for the edema that occurs in the period following the first few weeks of acute nephritis. When edema develops after the first weeks, it usually signifies that the nephritis is going into the degenerative or subacute or chronic phase, and its prognostic significance is important. Edema alone with the urinary syndrome occurred 11 times, and of 89 cases edema was present in 42.

(*c*) *Hypertension.*—Of 89 cases, hypertension occurred in 33. It was the only syndrome besides the urinary syndrome in 6 cases. Formerly hypertension was considered a constant feature of acute nephritis, but this idea is no longer held. Hypertension may be lacking throughout the entire course of the disease. Its onset in the course of acute nephritis, however, is significant. Although the patient with acute nephritis may progress unfavorably without hypertension, its onset is always a discouraging and sinister event. When hypertension develops in the latent stage of nephritis, as it often does, the chances of complete healing may be given up in almost every case.

(*d*) *Nitrogen Retention.*—Elevation of the nonprotein nitrogen content occurred in 30 cases and alone with the urinary syndrome in 8 cases of the 89. In the early period of acute nephritis a rise in the blood urea nitrogen level is of little significance, but when it occurs after the first ten days its presence causes great concern, because it indicates that the kidneys are not functioning as well as they were in the beginning, and the prognosis becomes doubtful. As a guide in the diagnosis of acute nephritis a study of the blood urea nitrogen content is not important, but as a prognostic indicator it is useful after the first ten days or two weeks of the disease.

(*e*) *Uremia.*—Genuine uremia occurred two times without any of the syndromes other than the urinary syndrome. Genuine uremia is the direct outcome of renal insufficiency and is entirely independent in origin of the convulsive seizures which may be associated with it. A rise in the blood urea nitrogen level is the precursor of uremia in most instances, and it is involved in the development of this syndrome. Any condition which interferes with the urinary output may lead to genuine uremia. The convulsive seizures may occur in connection with genuine uremia but are not dependent on renal insufficiency. The convulsions are associated with edema of the brain and usually are precipitated by acute hypertension. In 2 cases in this series convulsive seizures occurred without hypertension, but in most instances a diastolic pressure of 120 mm. of mercury, edema of the optic disks, fresh hemorrhages and fluffy white patches accompany convulsions. The pressure of the spinal fluid in convulsive uremia is usually increased from the normal of 150 mm. of water to 300 mm. While patients in whom genuine uremia develops hardly ever recover, it cannot be said that they never do so. The outlook is entirely different with the so-called convulsive type of uremia, which frequently clears up and appears to have little or nothing to do with the chances of a rather long life afterward. The prognosis of uremia, whether genuine, convulsive or compound, depends on the functional ability of the kidney and the persistence of the hypertension rather than on any one of the other numerous signs and symptoms.

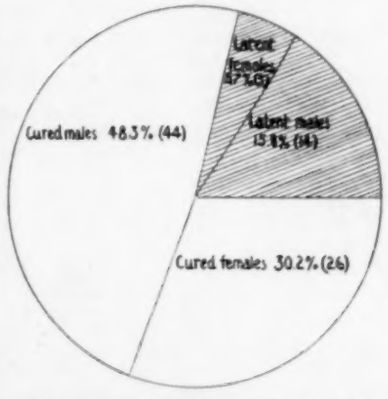

Chart 4.—Distribution according to sex of 89 patients with acute nephritis. Shaded area represents patients who went into a latent stage.

PROGNOSIS AND THE LATENT PERIOD

After the acute episode is over, whether it is mild, moderate or severe, there is a variable period of two months to two years in which some patients appear well but on careful examination of the urine show evidence of an inflammatory lesion in the kidney. This is called the latent period. It is characterized by a complete absence of clinical evidence of nephritis and

6. Fishberg, A. M.: Hypertension and Nephritis, ed. 3, Philadelphia, Lea & Febiger, 1934, p. 468.

by albuminuria and an excessive number of red blood cells, white blood cells and granular casts in the urine. It is an important phase of the disease, because during it the ultimate fate of the patient is often determined. Lack of proper consideration of this symptomless period

TABLE 1.—*Age and Sex in Eighty-Nine Cases of Acute Nephritis Followed for One to Ten Years*

Age Group	Male	Female	Totals
0-10	18	4	22
11-20	25	11	36
21-30	5	9	14
31-40	9	5	14
41-50	1	1	2
51-60	0	1	1
Totals	58	31	89

was considered by Snoke [5] to be responsible for conflicting views on the prognosis of acute nephritis. To this opinion we readily subscribe, as our previous observations [4] showed that failure to interpret data correctly in this period leads to faulty conclusions.

In this period of transition the kidney may gradually heal completely or the disease may progress into chronic nephritis. It may be difficult to say when the latent period is over and chronic nephritis begins, as the latent phase may merge gradually with the chronic form, but usually after two years the disease may be classed as chronic. Addis,[2] who was the first to study this latent phase adequately, observed that patients may remain in it for as long as ten years apparently in perfect health but always with an abnormally high number of red blood cells and a few blood casts.

More rigid adherence to the rules of treatment at this time may accelerate complete recovery, while laxity may retard healing. It is difficult to determine whether the renal lesion is healing or becoming chronic. The tests of renal function usually employed are insufficient for this purpose. It is essential to determine the degree of activity of the lesion in the kidney and by repeated examinations to observe whether healing or inflammation is gaining the ascendency.

TABLE 2.—*Age and Sex of Nineteen Patients with Latent Nephritis and of Seventy Patients Cured of Nephritis*

	With Latent Nephritis		Cured	
Age Group	Male	Female	Male	Female
0-10	1	1	17	3
11-20	9	3	16	8
21-30	1	1	4	8
31-40	2	0	7	5
41-50	1	0	0	1
51-60	0	0	0	1
Totals	14	5	44	26

Several methods have been used in obtaining this information, and we believe that a combination of the results of these tests forms a better prognostic guide than the results of any one test taken alone. To learn which course the disease is taking in a given case requires more than a single examination. Reliable data are dependent on these tests done not once but many times. We have employed the following procedures in most of our cases, and while not all the tests are of uniform importance we believe that all are good prognostic aids.

1. A count of the casts and cells in the urinary sediment by the method of Addis was the greatest aid of all. This test was done at regular intervals, depending on the nature of the case.

2. A study of the ability of the kidney to concentrate urine (Volhard's method) was found reliable. Progressive impairment of concentration pointed to a progressive unhealed lesion.

3. The blood urea clearance test has been used regularly in our cases, and we believe it has been helpful. When the urea clearance is low at the beginning and improves in time the outlook for the patient is good, but when repeated examinations show a tendency toward a drop in the percentage the outlook is unfavorable.

TABLE 3.—*Cause of Acute Nephritis in Eighty-Nine Cases*

	Number of Cases
Infection of upper respiratory tract	72
Pneumonia	3
Scarlet fever	2
Streptococcic meningitis	1
Purpura	1
Influenza	1
Gastroenteritis	1
Ruptured appendix	1
Undetermined cause	7

TABLE 4.—*Cause of Acute Nephritis in Nineteen Cases in Which the Disease Was in the Latent Stage*

	Number of Cases
Infection of upper respiratory tract	12
Pneumonia	1
Scarlet fever	2
Streptococcic meningitis	1
Purpura	1
Ruptured appendix	1
Undetermined cause	1

4. While not a basis for determining precisely the progress of the renal lesion, anemia that fails to respond satisfactorily to ordinary therapeutic measures, such as the administration of iron and vitamins, indicates that the renal lesion is probably becoming worse.

5. Estimations of the plasma proteins are important prognostically even though the plasma albumin does not drop to the critical level of 2 Gm. per hundred cubic centimeters. It is important to remember that a lowered plasma albumin content, for example 3 Gm. per hundred cubic centimeters, and a value for total protein of less than 5 Gm. per hundred cubic centimeters point to an unfavorable prognosis.

6. Finally, we have come to look on determination of the erythrocyte sedimentation rate as a valuable aid in prognosis (chart 5). While we cannot say that it is always accurate as a prognostic measuring stick, it nearly always is. We have employed this test for fifteen years in our clinic, and we believe that in general a rapid sedimentation rate indicates that an unhealed lesion is becoming progressive. A slowing down of the sedimentation rate points to a subsidence of the inflammation, while a normal rate points to a healed or almost completely healed lesion.

TREATMENT

That rest is valuable for the patient in general and for the kidney in particular is the first principle in the treatment of nephritis. In this paper we are concerned primarily with the treatment of the patient after the acute stage is over. Our results, especially in adults, emphasize the importance of keeping the patient in bed for several months if necessary after the clinical features have passed and until the last remnants of nephritis have disappeared. In chart 3 it may be seen that the 41 patients who were cured were those who remained in the hospital until well and that the 48 who left the hospital before cure was accomplished fared less well eventually. We grant that such prolonged enforced rest may be difficult in some cases because occasionally younger patients, their parents and unfortunately the medical advisor fail to recognize the need of it. But the end does justify the means in these instances. We enforce modified bed rest for four months; we believe that after this rigid adherence to inactivity fails to accomplish our purpose, since a chronic condition probably has set in, and rest is no longer enjoined.

Physical inactivity serves to obtain rest for the circulation, lessens the demand for food and metabolic activity and materially reduces the work of the crippled kidney. Rest for the kidney in particular is accomplished by regulation of the diet. This must not be taken to mean that the diet is inadequate. The daily protein intake should range from 0.75 to 1 Gm. per kilogram of body weight. Some patients may do well with less, and others may do better with a larger amount of protein. Protein starvation may spare the kidneys at the expense of the economy of the body in general, which is as bad as giving too much protein and retarding recovery of the renal units. From the experimental work of Addis,[7] Farr and Smadel[8] and Chanutin and Ferris[9] we note that the injured kidney heals faster when a low protein diet is given and slower or not at all when a high protein diet is given. The relative rest for the kidney conferred by a low protein diet is the factor considered important. Although experimental observations cannot be transferred wholly to clinical practice, reports from many quarters of good results with a low protein diet tend to substantiate this impression. Yet other investigators have expressed the belief that a high protein diet is not injurious to patients with acute nephritis. Keutmann and McCann[10] found that a high protein diet did not retard healing and that the return of renal function was accelerated. Naeraa[11] followed a number of patients with acute nephritis, making Addis counts, and came to the conclusion that a high protein diet is not harmful to the kidney. Mosenthal[12] and Cameron[13] both expressed the belief that a strictly low protein diet does not spare the kidney and that judging from their experience there is no need to fear that protein is injurious to the kidney in nephritis. Protein starvation, they said, is more likely than protein excess to harm the patient.

We believe that our diets containing 0.75 to 1 Gm. of protein per kilogram of body weight represent neither starvation nor an excess of protein but fulfil the protein requirements of the patient adequately and yet do not retard healing.

We[14] compared the high acid ash diet and the high alkaline ash diet in a series of cases of acute nephritis

TABLE 5.—*Syndromes in Eighty-Nine Cases of Acute Nephritis*

	No. of Cases
Urinary syndrome alone	25
Urinary and hypertensive syndromes	6
Urinary syndrome and edema	11
Urinary syndrome and elevated nonprotein nitrogen level	8
Urinary syndrome, elevated nonprotein nitrogen level and hypertensive syndrome	3
Urinary syndrome, elevated nonprotein nitrogen level, hypertensive syndrome and edema	5
Urinary syndrome, hypertensive syndrome and edema	12
Urinary syndrome, elevated nonprotein nitrogen level and edema	8
Urinary syndrome, elevated nonprotein nitrogen level, edema and hypertensive and convulsive syndromes	4
Urinary syndrome, edema and hypertensive and convulsive syndromes	2
Urinary and uremic syndromes	2
Urinary, uremic and hypertensive syndromes	1
Urinary syndrome, elevated nonprotein nitrogen level and convulsive syndrome	2

TABLE 6.—*Incidence of Syndromes in Eighty-Nine Cases of Acute Nephritis*

Syndrome	Urinary	Hypertensive	Edema	Elevated Nonprotein Nitrogen Level	Uremia	Convulsions
Number of cases	89	33	42	30	3	8

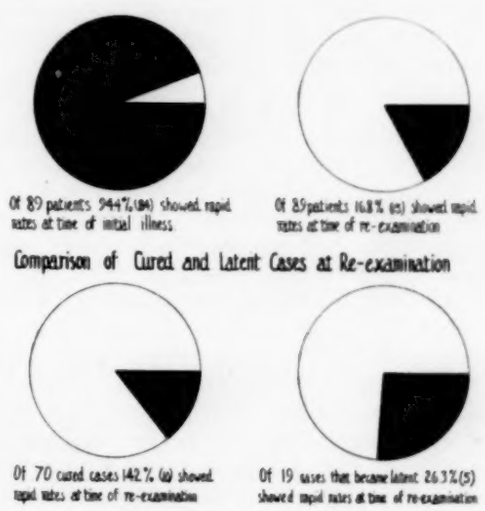
Of 89 patients 94.4% (84) showed rapid rates at time of initial illness
Of 89 patients 16.8% (15) showed rapid rates at time of re-examination
Comparison of Cured and Latent Cases at Re-examination
Of 70 cured cases 42.7% (30) showed rapid rates at time of re-examination
Of 19 cases that became latent 26.3% (5) showed rapid rates at time of re-examination

Chart 5.—Sedimentation rate of 89 patients with acute nephritis.

7. Addis, Thomas: Osmotic Work of Kidney and Treatment of Glomerular Nephritis, Tr. A. Am. Physicians **55:** 223, 1940.

8. Farr, L. E., and Smadel, J. E.: Influence of Diet on the Course of Nephrotoxic Nephritis in Rats, Proc. Soc. Exper. Biol. & Med. **36:** 472 (May) 1937.

9. Chanutin, A., and Ferris, E. B., Jr.: Experimental Renal Insufficiency Produced by Partial Nephrectomy: I. Control Diet, Arch. Int. Med. **49:** 767 (May) 1932.

10. Keutmann, E. H., and McCann, W. S.: Dietary Protein in Hemorrhagic Bright's Disease: I. Effects upon the Course of the Disease, with Special Reference to Hematuria and Renal Function, J. Clin. Investigation **11:** 973 (Sept.) 1932.

11. Naeraa, A.: Kvantitative Urinsedimentsbestemmelser: Et Bidrag til Belysning af Proteinsporgsmallet ved Nefritisdiaeten, Copenhagen, Nyt Nordisk Forlag-Arnold Brusk, 1936.

12. Mosenthal, H. O.: Treatment of Nephritis, Ohio State M. J. **35:** 1049 (Oct.) 1939.

13. Cameron, J. D. S.: Protein in Treatment of Nephritis (Honyman Gillespie Lecture), Edinburgh M. J. **46:** 386 (June) 1939.

14. Murphy, F. D., and Pietraszewski (Peters), B. J.: The Effect of Acid-Ash and Alkaline-Ash Diets in the Treatment of Acute Glomerulonephritis, Internat. Clin. **1:** 3 (March) 1940.

and found that as far as healing in the early stages is concerned there appears to be little or no difference. In cases of latent nephritis in which treatment is continued over longer periods the results are about the same as those mentioned.

The problem of giving salt and water during the healing phase is not a difficult one. Simple restriction of sodium chloride to an average quantity of 5 to 6 Gm. daily is sufficient. The intake of fluid should be tempered according to desire, but excesses should be guarded against. As to vitamins, it is essential to give sufficient amounts of A, the B complex, C and D. These are easily given before meals. While it is difficult to prove satisfactorily that the administration of iron is advantageous, in practice it has been shown to be helpful.

The theory advocating the removal of foci of infection in the treatment of nephritis has lost some of its popularity, but we believe such foci should be removed. Diseased tonsils, foci of infection in sinuses, apical abscesses or abscesses anywhere should be removed about one month after the passing of the acute episode. While statistics may fail to provide evidence of the benefit of such removal, the individual patient often shows striking benefit.

COMMENT

The ultimate prognosis rather than the immediate outcome of acute nephritis has been our chief interest for some time. Why some patients who have recovered from acute nephritis are completely healed and others progress gradually into the stage of chronic nephritis is an unsolved problem. There seem to be some factors, however, which influence the course of the disease. In our review of the cases in this series we have attempted to determine what factors accelerated or retarded the complete healing of the renal lesion.

We were impressed particularly by the fact that the lesion which failed to heal immediately tended to do so eventually if rest and careful attention to simple regulations of treatment were adhered to.

The acute phase of nephritis was observed to be the forerunner of the chronic form in a sufficient number of cases to convince us that the relationship is more than coincidental. We believe that the failure to understand the significance of the latent phase is one of the main stumbling blocks in the recognition of the relationship between the acute and the chronic form. Rigid adherence to the regimen of rest when there is even slight activity of the renal lesion helps bring about complete recovery. The intensity of the initial stage of acute nephritis has little or no bearing on the ultimate outcome, but the duration of the disease which precipitates the acute nephritis may often have an effect on the ultimate outcome of the renal lesion. While in itself the age of the patient is probably not an important factor in prognosis, in our series the persons aged 10 to 20 years got along less well than those in the other age groups. The retarding of recovery is due not so much to the age as to the fact that patients at this time of life are more difficult to control and are less amenable to treatment.

The prognosis in various series of cases depends on factors that are not often mentioned. For example, patients in a large charity hospital are apt to be admitted for treatment after a delay of some weeks following the onset of the acute stage. It is more difficult to convince patients who come to such an institution of the importance of rigid treatment when they feel no pain or distress of any kind. Judging from Snoke's [5] comparative study of cases in San Francisco and in Rochester, N. Y., it may be said that the geographic location may be one of the deciding factors in prognosis.

Many reports have shown a uniformly good prognosis in acute nephritis. Ludbrook [15] stated that 97 per cent of the 60 patients with acute nephritis in his series followed from one to six years were entirely cured at the time he wrote. Aldrich,[16] Blackfan,[3] Richter [4] and Tallerman and Burkinshaw [3] expressed the view that most patients make a complete recovery. In an after-study of acute nephritis among soldiers in the first World War, Keith and Thomson [17] gave a favorable report concerning the ultimate outcome; yet they emphasized that the prognosis as to complete recovery must be guarded.

Our observations, both of the present and of former series,[18] do not support the contention that nearly all patients with acute nephritis recover completely. Still,[19] Snoke,[5] and Folkers [20] have reported series of cases in which the ultimate outcome was not favorable. Longcope [21] followed 134 patients for one to fourteen years and reported 42.5 per cent with healed, 33 per cent with latent and 11.2 per cent with chronic nephritis, while 14.2 per cent had died.

SUMMARY

1. Of 205 patients with acute glomerular nephritis observed from two to ten years, including both adults and children but mostly adults, 55, or 26.8 per cent, acquired chronic nephritis; 26, or 12.6 per cent, died in the acute stage, and 19, or 9.2 per cent, entered the latent stage. Thirty-five, or 17 per cent, although clinically cured at the time of discharge did not return for reexamination. Seventy patients, or 34.4 per cent, were completely cured. Correcting these figures to exclude the patients not returning for examination, we have an amended figure of 41 per cent for patients completely healed. If we group the patients with chronic and those with latent nephritis, approximately 36 per cent have some evidence of renal involvement; similarly, if this percentage is corrected 43.5 per cent of our patients still show latent or chronic nephritis.

2. The prognosis was found to be no better when the initial stage was mild than when it was severe or stormy.

3. The latent period is significant and should be emphasized, for in it the ultimate fate of the patient is often determined.

4. We do not believe that the prognosis of acute nephritis is as favorable as many investigators have reported.

536 West Wisconsin Avenue.

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16. Aldrich, C. A.: Clinical Types of Nephritis in Childhood, J. A. M. A. **94**: 1637 (May 24) 1930.
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18. These are listed in footnotes 1 and 4.
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20. Folkers, L. M.: Acute Glomerular Nephritis: A Report of Sixty-Eight Cases, J. Iowa M. Soc. **25**: 552, 1935.
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ABSTRACT OF DISCUSSION

DR. N. M. KEITH, Rochester, Minn.: Drs. Murphy and Peters' statistical results of cured cases are very similar to those of Hume and Nattress, who followed up cases of acute trench nephritis of the soldier after the great war in Newcastle, England. They found that of some 280 patients about 45 per cent were cured after a period of several years. Dr. Longcope of Baltimore has also reported about the same number of cured cases in his series. That is an important fact and I believe that Dr. Murphy and all of us will agree that we must and can have a larger percentage of cured cases. Apparently a great many of these patients leave the hospital too soon and after dismissal do not get the care they should. I think it is important, as Drs. Murphy and Peters pointed out, that we must do our best in the latent stage to be sure that these patients are not still suffering from the disease. Dr. Addis, I think, has done us a great service by instituting his test of counting the number of red cells present in the urinary sediment of these patients. Drs. Murphy and Peters have mentioned the removal of foci. I believe, like Dr. Longcope, that when there is an active focus it should be removed and, if possible, after the acute renal episode has subsided. Drs. Murphy and Peters stated that they like to keep these nephritic patients in bed for four months. I do not think that there should be any arbitrary fixed rule; however, I believe it is better to err on keeping the patients too long than too short a time in bed. A patient of mine, a young man with acute nephritis with severe albuminuria, hematuria and hypertension, was given a diet such as the authors advocate. This man was an orderly in our hospital. We were thus able to watch him carefully and keep him in the hospital for approximately two months. He did well. It is eighteen months since his initial attack. What I want to bring up is that I am not certain yet that he is cured. He will have to be observed further, in spite of a normal urine, for albuminuria and hematuria, eighteen months after the initial attack of acute nephritis.

DR. MOSES BARRON, Minneapolis: I agree with nearly everything the authors say in their paper on nephritis. Their statistics parallel those in the better clinics of the country. They quoted some authorities who give higher percentages in recoveries, some as high as 96 per cent. I think those high figures occur as a result of errors in diagnosis. Undoubtedly the milder forms of focal nephritis following many acute infections which usually go on to complete restitution are included in those statistics of glomerular nephritis. A much smaller percentage of cases of acute nephritis following scarlet fever pass into the latent or chronic state, probably only 5 or 7 per cent instead of 30 or 40 per cent. In acute diffuse glomerular nephritis about 10 per cent die in the acute stage. Death is due to acute infection, otitis media, pneumonia, uremia and occasionally heart failure. I wish to emphasize the importance of watching cases of nephritis for heart failure, since digitalis may prove life saving. The poor circulation from a failing heart may throw a not severe renal insufficiency into a fatal uremia. The first three or four days' diet should consist of a little fruit, orangeade, lemonade and a restricted fluid intake to a total of 300 to 500 cc. For the next few days a little more fruit and fluid may be added. Later small amounts of protein, starches and fats are gradually added until the proper caloric intake is provided. The protein should be increased to not more than two thirds of a gram of protein per kilogram of body weight. I agree with the authors that excessive protein in the diet is deleterious during the acute stages of nephritis. An increased amount of protein means increased work for the kidneys and this leads to greater damage to the already diseased kidneys. One must differentiate between hypertensive encephalopathy and true uremia, which may accompany advanced stages of nephritis. The treatment of these two conditions is entirely different. Uremia is always associated with the retention of metabolic products in the blood as a result of renal insufficiency. The blood pressure in some instances may be normal. In hypertensive encephalopathy the blood chemistry may be entirely normal but the blood pressure is always greatly increased. The treatment of hypertensive encephalopathy is venipuncture, spinal puncture, magnesium sulfate by mouth and intravenously, and the prevention of convulsions by restriction of fluids and the use of morphine if necessary. I believe that treatment of glomerular nephritis is most important in the acute stage. During the latent period there is little that one can do except advise against chilling. One cannot keep patients at absolute rest all the time. They should be watched for the first signs of an exacerbation and then again be subjected to the treatment applied in an acute case.

THE LOCAL USE OF SULFANILAMIDE IN THE TREATMENT OF PERITONEAL INFECTIONS

R. STERLING MUELLER, M.D.
AND
JAMES E. THOMPSON, M.D.
Assistant Attending Surgeons, Roosevelt Hospital
NEW YORK

Two years after the report of Domagk [1] in 1935 concerning the chemotherapeutic properties of azosulfamide, certain bacterial infections were commonly treated with sulfanilamide with excellent results. Given by mouth, by rectum or by hypodermoclysis at regular intervals, therapeutic blood and tissue concentrations could be maintained which had a definite bacteriostatic effect on certain organisms. In April 1937 Sinclair and Barker [2] departed radically from the usual plan of administration of sulfanilamide and for the first time made use of high local concentrations of the drug for the treatment of localized infections. They used crushed sulfanilamide tablets in dental surgery, such as for infected operative wounds in the mouth, certain extractions, compound fractures and osteomyelitis of the mandible—with good results in the prophylaxis and treatment of infections. In July 1939 Jensen, Johnsrud and Nelson [3] reported a series of compound fractures treated with local implantation of sulfanilamide. In this series no instances of primary infection occurred. Other reports of its local use followed shortly and it soon became evident that, if proper amounts of the drug were used, toxic levels in the blood did not occur. On Jan. 10, 1940 sulfanilamide was first used intraperitoneally at the Roosevelt Hospital [4] in a desperate attack of diffuse peritonitis. This critically ill patient made such a dramatic and unexpected recovery that it was used in other similar abdominal conditions with equally good results. Within a short time in this hospital the local use became a routine procedure in all kinds of infections or contaminated peritoneal conditions.

With the use of sulfanilamide locally, either in soft tissues or in body cavities, local concentrations from seventy-five to one hundred times higher than systemic concentrations may be obtained directly at the source of the infection. Furthermore, with proper amounts of the drug, absorption into the blood or tissue fluids does not exceed safe therapeutic levels, and no injurious action in tissues exposed to the concentrated drug is seen. Such high concentrations naturally have a higher bacteriostatic effect than the usual blood levels. We feel, from clinical observation, that even more organisms

Dr. John A. Brabson helped with the statistics used in this paper.
Read before the Section on Surgery, General and Abdominal, at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

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3. Jensen, N. K.; Johnsrud, L. W., and Nelson, M. C.: The Local Implantation of Sulfanilamide in Compound Fractures, Surgery **6**: 12 (July) 1939.
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may be effected and that the action of the drug approaches that of a bactericidal agent. In many ways sulfanilamide compounds used locally are ideal tissue antiseptics in that they seem to have a low toxicity for tissue unlike other presulfanilamide compounds.

Fig. 1.—Lower half, microscopic view of sulfanilamide crystals. Upper half, microscopic view of peritoneal exudate from patient, post mortem, in which the spaces occupied by the crystals may be seen.

We have continued to use the parent compound sulfanilamide rather than its derivatives sulfapyridine, sulfathiazole and sulfadiazine in all our peritoneal cases—first, because we began with that particular drug and have had no unpleasant experiences with it in the peritoneal cavity; second, because more is known about the fate of sulfanilamide in the human body in regard to its absorption, toxicity and excretion, and finally, because many patients must be treated with these compounds before the clinical observations and experimental investigations can be evaluated for that particular drug, in regard to its place as an adjunct to the surgical care of peritoneal infections. Sulfathiazole may be used instead with good results. In cases of abscess equal amounts of sulfanilamide and sulfathiazole may be used in the abdominal cavity and elsewhere. We are trying this combination at present.

STERILIZATION OF SULFANILAMIDE POWDER

The most suitable container for sulfanilamide powder is a sterile test tube in which the drug is placed in weighed amounts and sterilized. It is convenient to have amounts of 2, 4, 6 and 8 Gm. available in the operating room. The tubes are stoppered with a cork or cotton and then further sterilized by means of dry heat for two hours at 140 C. This causes no change in the crystalline powder. The other sulfanilamide compounds may be sterilized in the same way. The drug may also be autoclaved if moisture is not allowed to reach the powder, but if moisture does reach the drug during sterilization the powder is converted into a solid mass which cannot be removed from the tube and is unfit for local surgical use. Sulfanilamide may also be obtained in sterilized form in ampules. However, it is not as easy to sprinkle the drug into the peritoneal cavity from the narrow necked ampules as from uniform width test tubes. It was difficult in the first few cases to determine the proper and safe amount of the drug which should be used. It so happened that we had been using 10 to 15 Gm. of sulfanilamide locally elsewhere in the body in compound fractures and in large dirty traumatic wounds. Therefore, in the first case about 12 Gm. was used. Since blood levels, taken postoperatively in this case, were within safe therapeutic limits, we felt that it was safe to continue to use about this amount. Infections of lesser degree require less of the drug. In peritoneal infections of very severe involvement, or when massive soiling of the peritoneal cavity has occurred, we have not hesitated to use even larger amounts. A total dose in the peritoneal cavity alone should never exceed 15 Gm. The cases in which drainage is established require more of the drug locally than those in which the cavity is closed without drainage, since a certain amount of the drug is lost through drainage.

Of the total amount of sulfanilamide used in any 1 case, two thirds is placed in the peritoneal cavity and the remaining third is sprinkled in the layers of the abdominal wall. Placing some of the drug in the

Fig. 2.—Microscopic view of sulfanilamide crystals in peritoneal exudate of rabbit forty-eight hours after operation.

abdominal wall has, without question, increased the rapidity of wound healing in cases of purulent infection. There is no doubt that involvement of the wound seems more limited and localized in the vicinity of the emerging drains. This has been such a consistent finding that in some of the cases of frankly purulent infection

we have closed the wound around the drains rather than suturing the peritoneum only and leaving the other layers unsutured. In many cases of peritonitis drainage of the peritoneal cavity could be eliminated with the use of sulfanilamide powder, but we believe that this is generally unwise. At least for the present the old rule "when in doubt, drain" should be followed

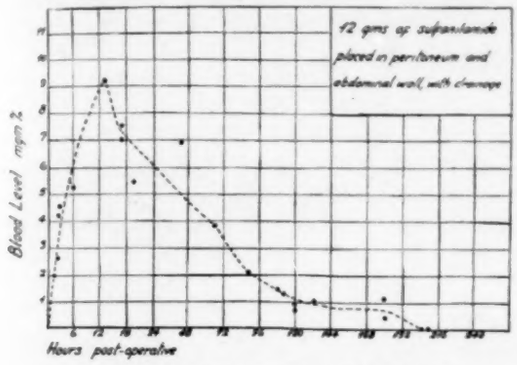

Fig. 3.—Computed average blood level curve.

as it was before the use of this drug. There are many cases of peritoneal infection not severe enough to justify the use of sulfanilamide in the peritoneal cavity but in which it is good practice to use 2 to 4 Gm. in the layers of the abdominal wall only. This will prevent or lower the incidence of infection in moderately contaminated wounds.

In very young children and infants the total dose of sulfanilamide used in the peritoneal cavity and abdominal wall should not exceed 3 to 4 Gm. Since age and weight modify the dose, it is safe to calculate the dose on a basis of 175 mg. per kilogram of body weight, after one has taken into consideration the degree of infection or contamination present.

TECHNIC OF LOCAL USE

The powdered drug is sprinkled into the peritoneal cavity as near the focus of infection as possible. This is considered a better method than that of depositing the drug in a mass in one place only, as we had formerly done. When no focus of infection has been found or when the patient is too ill to permit its removal, the powdered drug is deposited over the peritoneal surfaces beneath or adjacent to the incision. If the drug is deposited in one mass, where it remains in prolonged contact with a serosal surface, a local hemorrhagic area covered with fibrin may occur. There is no evidence in our series of cases that any harm has resulted because of it being used in this manner. It is usual for some hyperemia to occur in the immediate region where the sulfanilamide comes into contact with the peritoneum, but this lasts only for a short time. A moderate amount of serosanguineous discharge escapes from the drain during the first thirty-six hours after the operation. In cases in which a postmortem examination has been made three or more days after the operation, fluid is not found in the peritoneal cavity and no trace of hyperemia is seen. Before the drug is placed in the abdominal cavity clamps should be applied to the peritoneum preparatory to its being sutured, since the powder may obscure the field.

In the lower half of figure 1 a microscopic view of the sulfanilamide crystals is shown. In the upper half is a section of peritoneal exudate in which the spaces occupied by the crystals may be seen. This section was taken from a patient operated on for peritonitis from diverticulitis of the colon and who died of lipid pneumonia. The small number of cells in the meshwork of fibrin around the crystals indicate the absence of irritative action of the sulfanilamide. Figure 2 is a similar section from the peritoneal cavity of a rabbit. The original photographs are the property of the department of pathology of Columbia University College of Physicians and Surgeons.

There is no clinical evidence that sulfanilamide used locally has any deleterious effect on catgut used in the abdominal wall or in the peritoneal cavity. We have not noticed any interference with wound healing; on the contrary, infected or contaminated wounds have healed with great rapidity, as compared with similar wounds not treated with the drug.

ABSORPTION OF SULFANILAMIDE

Postoperative blood levels have been taken in nearly all our cases and, in 20 cases, level determinations have been taken at frequent intervals. Sulfanilamide is rapidly absorbed from peritoneal surfaces. As soon as twenty minutes postoperatively blood levels of 2 to 3 mg. per hundred cubic centimeters have been observed. While the initial rise is rapid and fairly consistent, the fall in the blood level is much more gradual but shows the same consistency (fig. 3). The peak of the blood level is reached in from ten to eighteen hours and averages 7 mg. per hundred cubic centimeters. At the end of one hundred and seventy-five hours, in undrained wounds, levels from 0.5 to 1 mg. per hundred cubic centimeters are found. As a rule, after two hours no trace of sulfanilamide is found in the blood. In cases in which drainage is instituted the height of the initial rise is lower and the blood level falls more rapidly.

It must be remembered that absorption is occurring from two different places and two different kinds of tissue, i. e. the peritoneal cavity and the operative wound. The drug is absorbed less rapidly, and for a longer period, from the abdominal wall than from the

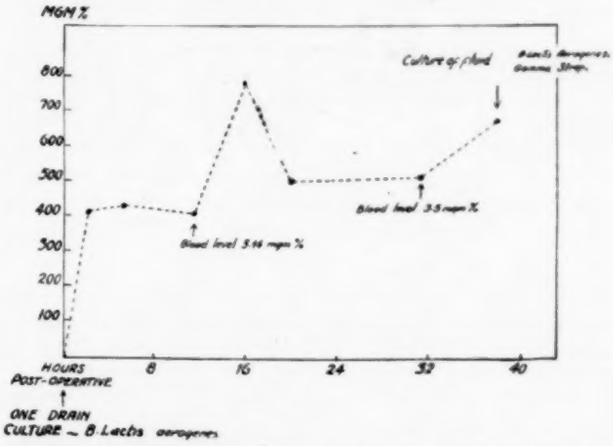

Fig. 4.—Sulfanilamide levels in drainage fluid of a patient with appendical abscess.

peritoneal cavity. When the sulfanilamide is used in the peritoneal cavity alone, and not in the abdominal wall, the fall of the blood level to zero takes place in from seventy-five to one hundred hours.

Draper and Kauer [5] have shown that after the intraperitoneal application of sulfanilamide in dogs the blood

5. Draper, J. W., and Kauer, J.: Personal communication to the authors.

level reached its peak in about six hours and rapidly approached zero in from sixty-five to seventy-five hours.

We mention these blood levels and absorption rates of sulfanilamide only as an indication that the drug is not absorbed into the system in toxic amounts. The greater the amount used, and the less it is allowed to be lost through drainage, the higher the possible blood level. Unless infection is present elsewhere outside the peritoneal cavity, the systemic concentration of the drug is of secondary importance only. The high levels, from 300 to 800 mg. per hundred cubic centimeters, that we have been able to obtain from samples of peritoneal fluid for more than forty hours postoperatively cannot be produced by the administration of any other form of the drug and are the active factors in controlling the peritoneal infection. We are unable to say at present whether the fall in peritoneal concentrations parallels the fall in systemic levels (fig. 4).

TABLE 1.—*Acute Appendicitis Series: 1935-1939*

Type	Cases	Deaths	Mortality, per Cent
Acute	566	3	0.53
Abscess	59	4	6.78
*Peritonitis	117	14	11.96
Total	742	21	2.83

* An additional death was discovered in this group after previous publication of this table.

An analysis of acute appendicitis at Roosevelt Hospital during the five year period 1935-1939 is used as a background against which we hope to contrast our results since using sulfanilamide.

There was a total of 742 cases of acute appendicitis during the 1935-1939 period. In an analysis of such a series of cases certain criteria must arbitrarily be chosen to classify the various types of lesions so that they may be easily and clearly understood as well as easily and accurately compared with similar groups. It is for this reason that we eliminate the many confusing terms and classify acute appendicitis in the following manner.

Group 1.—Simple acute appendicitis. Here there is no gross perforation, and culture of fluid, if present, shows no growth. There were 566 cases of this variety with 3 deaths, a mortality of 0.53 per cent.

TABLE 2.—*Analysis of Deaths: 1935-1939*

	Deaths
Diffuse peritonitis	13
Postoperative pneumonia	3
Pylephlebitis and septicemia	2
Pulmonary embolism	1
Rheumatic heart and decompensation	1
Acute purulent cystitis	1
Total	21

Group 2.—Acute appendicitis with localized abscess formation. There were 59 of this variety with 4 deaths, a mortality of 6.78 per cent.

Group 3.—Acute appendicitis with peritonitis. This final group includes both cases of spreading or diffuse peritonitis and those of the localized variety. It is believed that it is impossible to obtain a true knowledge of the extent of peritonitis through a McBurney incision, which was used in more than 95 per cent of our cases. The impression would vary with the individual surgeon and could be accurately determined only after an exploratory operation. There were 117 such cases with 14 deaths, a mortality of 11.96 per cent.

The total number of deaths was 21 in the three groups, giving a total mortality of 2.83 per cent. A fuller analysis of these deaths can be obtained from glancing at table 2, but needless to say the majority was directly attributable to peritonitis.

In January 1940 we began to use sulfanilamide in cases of severe appendicitis. The first few patients were desperately ill, the peritonitis in each instance seemed diffuse in character and the fluid was frankly purulent and had a fecal odor. The convalescence and cure of these patients was so dramatic that one could not help but be impressed with the value of the drug used in this manner.

A review of our past experience in the bacteriology of acute appendicitis with abscess formation and peritonitis showed that Bacillus coli was the predominant organism in 83 per cent of the cases. Other organisms encountered as etiologic factors in their order of frequency were gamma streptococcus and beta streptococcus. Sometimes associated with B. coli or with the streptococcus organisms were Bacillus lactis aerogenes and Bacillus mucosus capsulatus. No anaerobic cultures were taken.

TABLE 3.—*Sulfanilamide Used Locally in Cases of Acute Appendicitis (January 1940-May 1941)*

Type	Cases	Deaths
Acute	31	0
Abscess	18	0
Peritonitis	41	0
Total	90	0

TABLE 4.—*Cases of Acute Appendicitis (January 1940-May 1941)*

Type	Cases	Deaths
Acute	201	0
Abscess	23	0
Peritonitis	44	0
Total	268	0

We have noticed no definite toxic effects except some cyanosis, which, though not a constant feature, is usually evident. The nausea and vomiting, if present, have not been sufficiently distinguishable from that to be expected in a patient convalescent from any operation.

There have been no cases of leukopenia or acute agranulocytosis, but there was 1 case of jaundice which was felt to be secondary to infection, as it disappeared under continued administration of sulfanilamide by mouth.

Persistent elevation of temperature did occur in a few instances, and in several of these cases it was felt to be directly attributable to the sulfanilamide.

In those patients in whom sulfanilamide was used, the ages ranged from 1 year to 72 years. The lesion in 45 per cent of the peritonitis group could definitely be considered diffuse. Many of these patients were critically ill; in a few instances the condition of the patient and the local conditions presented a hopeless picture.

From January 1940 to May 1, 1941 we operated on a total of 268 patients with appendicitis and its complications. There were no deaths in any one of the three varieties of the disease. Sulfanilamide was used in a total of 90, or 33.6 per cent, of the cases, representing the most severe varieties of the disease. In 16 of these 90 instances the administration of the drug was continued either by rectum or by mouth, because of the

extremely severe pathologic process encountered at operation or because of the continued critical condition of the patient. The added experience with dosage has led us to believe that a sufficiently large intraperitoneal application might eliminate the necessity for any continued postoperative administration.

TABLE 5.—*Comparison of Important Complications*

Type of Complication	1935-1939 (741 Cases) Number	1935-1939 (741 Cases) Percentage of Total Cases	Jan. 1, 1940 to April 1, 1941 (250 Cases) Number	Jan. 1, 1940 to April 1, 1941 (250 Cases) Percentage of Total Cases
Wound complication	85	11.5	13	5.2
Secondary peritoneal abscess	21	2.8	2	0.9
Atelectatsis	16	2.1	7	2.8
Pneumonitis	12	1.6	0	0
Wound separation	8	1.1	0	0
Phlebitis	5	0.7	1	0.5
Pylephlebitis	2	0.27	0	0
Jaundice	1	0.13	1	0.5

Complications were relatively few in the total series, and there was a noticeable reduction in wound infections and secondary peritoneal abscesses as compared to the previous years.

It has been used in other peritoneal infections as a therapeutic agent, but to evaluate its relative importance in lowering the mortality rates in these specific conditions will take time. A thorough comparative analysis of large numbers of cases within each group will be necessary before any conclusions can be reached (table 6).

We urge its use in cases in which there has been extensive soiling from perforated peptic ulcer, particularly in those instances in which the perforation has existed longer than twelve hours. It has seemed successful in diverticulitis, perforations of the intestine, gunshot wounds, acute biliary surgery, complete hysterectomy, certain cesarean sections and other similar conditions.

In cases of acute salpingitis in which operation was performed on the bases of a mistaken diagnosis, it caused an unusually smooth and rapid convalescence.

The dose employed in these cases has been on the same basis as that recommended in the treatment of appendicitis.

TABLE 6.—*Intra-Abdominal Application of Sulfanilamide (Exclusive of Acute Appendicitis)*

	No. of Cases	Deaths
As a prophylactic measure in abdominal surgery	90	8
As a therapeutic measure for peritonitis or abscess	21	6
Total	111	14

We are using it more and more frequently in elective surgery of the gastrointestinal tract, as a prophylactic agent, when actual or suspected soiling of the peritoneal cavity has occurred and when sulfaguanadine has not been used preoperatively. The dose under these circumstances has been considerably less, varying between 2 and 8 Gm.

SUMMARY AND CONCLUSIONS

Sulfanilamide is recommended for use intraperitoneally when any form of peritonitis is encountered at operation.

Its use in routine abdominal surgery when actual or suspected soiling has occurred will probably reduce the incidence of peritonitis and death.

It produces high local concentrations within the peritoneal cavity—from seventy-five to one hundred times the level reached in the circulating blood. This high local concentration seems to have a bacteriostatic or destructive effect on the bacteria.

There have been no serious local or general toxic effects of the drug when used in the recommended doses. The dose advised is 175 mg. of sulfanilamide per kilogram of body weight, two thirds to be applied intraperitoneally and one third in the wound layers. The total dose should never exceed 18 Gm., and this amount should be used only in cases of unusually severe involvement.

There have been no deaths among 268 patients with acute appendicitis since its use was commenced in January 1940. This experience encourages us to endorse whole heartedly the use of sulfanilamide intraperitoneally when indicated. We do not wish to give the impression that the mortality rate in cases of acute appendicitis will henceforth approximate zero, as we feel unusually fortunate that there were no deaths from embolism or other conditions entirely dissociated from peritonitis. We are firmly convinced that the application of this new weapon will lower mortality rates in all forms of peritoneal infection.

TABLE 7.—*Deaths in Which Sulfanilamide Was Used Intraperitoneally* *

	No. of Cases †
Chronic ulcerative colitis; subtotal colectomy	2 (P)
Traumatic rupture of urinary bladder, fractured pelvis	1 (P)
Gangrenous ileum; peritonitis; resection; 9 day history	1 (T)
Gunshot wounds of abdomen, neck and back	1 (P)
Carcinoma of bladder; ureterosigmoid anastomosis	1 (P)
Carcinoma of colon; Mikulicz's; 70 years old	1 (P)
Ulcerative ileitis with perforation, peritonitis	1 (T)
Empyema perforated through left diaphragm	1 (T)
Severe traumatic penetrating wounds of chest and abdomen; evisceration	1 (T)
Perforated carcinoma of rectum, peritonitis of 36 hours' duration	1 (T)
Adenocarcinoma of colon; resection	1 (P)
Actinomycotic abscess of liver	1 (T)
Traumatic perforations of ileum, ruptured liver, fractured pelvis, fractured vertebrae	1 (P)
Total	14

* Many of these cases came to autopsy and in each case peritonitis was not found. A few patients died several hours postoperatively from shock due to the grave injuries. A few died two to three weeks postoperatively. The remainder died of pneumonia or of cardiorenal failure. Five patients with diverticulitis and peritonitis were operated on without a death.

† (P) prophylactic; (T) therapeutic.

NOTE.—Since this article was read in Cleveland the completed statistics on the intraperitoneal use of sulfanilamide as of Jan. 5, 1942 show that operations in 400 cases of acute appendicitis have been performed at the Roosevelt Hospital without mortality. About one third of these, 133 cases, were severe enough for the use of intraperitoneal sulfanilamide.

Instead of estimating the amount of sulfanilamide to be used by milligrams per kilogram of body weight, an easier guide for dosage is to take 8 per cent of the pounds of body weight in order to obtain the number of grams of sulfanilamide to be used in the average case in which drainage is employed. In the average case without drainage 6 per cent of the body weight in grams gives the proper amount, allowance always being made for the degree of infection present; i. e., more or less being used than the amount estimated according to the degree of infection present.

16 East Ninetieth Street.

THE USE OF SULFANILAMIDE IN THE PERITONEUM

EXPERIMENTAL AND CLINICAL OBSERVATIONS

HOWARD C. JACKSON, M.D.
AND
FREDERICK A. COLLER, M.D.
ANN ARBOR, MICH.

Implantation of crystalline sulfanilamide in the peritoneal cavity has been practiced by many surgeons during the past year. Local application of sulfanilamide and its derivatives has been a valuable method of utilizing these drugs. In 1939 Jensen, Johnsrud and Nelson [1] reported the implantation of sulfanilamide in compound fractures with a considerable reduction in the usual incidence of infection. Burns, chronic ulcers, infected wounds, mastoid cavities, the lesions of acute and chronic osteomyelitis, meningeal abscesses and infected pleural cavities all have been treated with topical chemotherapy.

When sulfanilamide first came into use it was felt to be effective primarily against infections with hemolytic streptococci. With sulfanilamide treatment, a reduction in mortality due to primary streptococcic peritonitis was reported.[2] In peritonitis associated with appendicitis the infection is often a mixed one, with colon bacilli, Welch bacilli and various strains of streptococci commonly participating; [3] yet Ravdin, Rhoads and Lockwood [4] found such peritonitis favorably influenced by sulfanilamide therapy. At about the same time Garlock and Seley [5] reported the successful use of sulfanilamide in preparation for operations on the colon.

It is not surprising, therefore, that the local use of sulfanilamide in the peritoneum was tried. Rippy [6] has used sulfanilamide intraperitoneally in treating gunshot wounds of the abdomen. Within the past year Dees,[7] Rosenburg and Wall [8] and Thompson, Brabson and Walker [9] have advocated the local application of sulfanilamide in the treatment of acute appendicitis. Wangensteen [10] reported the intraperitoneal use of powdered sulfanilamide in resections of the colon.

There is a sound rationale for the local use of sulfanilamide for both the treatment and the prophylaxis of peritoneal infection. Lockwood and Rhoads [11] have emphasized that an inflammation of a serous surface is the type of lesion which might be expected to respond favorably to chemotherapy. The organisms most commonly found in peritonitis are susceptible to the drug.[12] In the usual concentrations and in the tissues sulfanilamide and its derivatives are probably only bacteriostatic.[13] If these drugs are accepted as bacteriostatic agents, infection or contamination of the peritoneum is a likely situation in which to employ them. By halting bacterial multiplication the drugs place the bacteria more completely at the mercy of the capable natural defenses of the peritoneum.

In general the effectiveness of sulfanilamide is proportional to its concentration. There are modifying factors, such as the nature of the lesion and the character of the exudate, for the wall of an abscess may form a barrier beyond which the blood-borne drug passes with difficulty, and an exudate rich in the products of tissue necrosis contains inhibiting substances.[14] The local use of sulfanilamide is advantageous, because the drug can be placed in the center of a suppurating or contaminated area, where its local concentration becomes maximal. In the absence of suppuration even more favorable results can be expected, because no inhibiting substances are present. Under these circumstances the use of sulfanilamide in the peritoneum is similar to its local use in compound fractures, where contamination exists but frank suppuration is not established. Therefore, when open anastomoses have been made, when there has been accidental soiling of the peritoneum with the contents of the gastrointestinal tract, when walled-off abscesses have been broken into and the remainder of the abdomen exposed to contamination, then local chemotherapy should be of great value in aiding the natural peritoneal defenses.

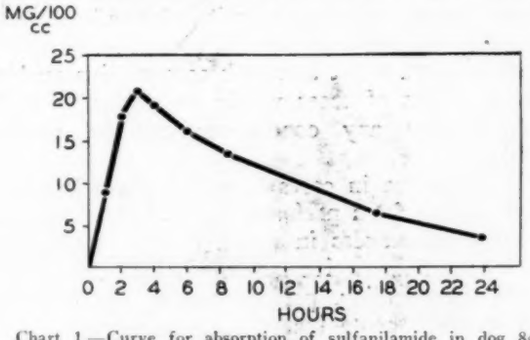

Chart 1.—Curve for absorption of sulfanilamide in dog 848 (weight 10 Kg.) following intraperitoneal implantation. Two Gm. of sulfanilamide, or 0.2 Gm. per kilogram, was given.

During the past eighteen months we have used sulfanilamide intraperitoneally in suitable patients. We were uncertain what were safe doses and what harmful effects might result. Lockwood and his co-workers [15]

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From the Department of Surgery of the University of Michigan Medical School.

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1. Jensen, N. K.; Johnsrud, L. W., and Nelson, M. D.: Local Implantation of Sulfanilamide in Compound Fractures, Surgery **6:** 1 (July) 1939.

2. Ladd, W. E.; Botsford, T. W., and Curnen, E. C.: Primary Peritonitis in Infants and Children: A More Effective Treatment, J. A. M. A. **113:** 1455 (Oct. 14) 1939.

3. Meleney, F. L.; Olpp, J.; Harvey, H. D., and Jern, Helen Z.: Synergism of Bacteria Commonly Found in Peritoneal Exudates, Arch. Surg. **25:** 709 (Oct.) 1932. Altemeier, W. A.: Bacterial Flora of Acute Perforated Appendicitis with Peritonitis, Ann. Surg. **187:** 517 (April) 1938.

4. Ravdin, I. S.; Rhoads, J. E., and Lockwood, J. S.: The Use of Sulfanilamide in the Treatment of Peritonitis Associated with Appendicitis, Ann. Surg. **3:** 53 (June) 1940.

5. Garlock, J. H., and Seley, G. P.: The Use of Sulfanilamide in Surgery of the Colon and Rectum, Surgery **5:** 787 (May) 1939.

6. Rippy, E. L.: Perforating Gunshot Wounds of the Abdomen, J. A. M. A. **115:** 1760 (Nov. 23) 1940.

7. Dees, J. G.: Valuable Adjunct in Perforated Appendices, Mississippi Doctor **18:** 215 (Sept.) 1940.

8. Rosenburg, S., and Wall, N.: The Treatment of Diffuse Peritonitis by the Direct Intraperitoneal Introduction of Sulfanilamide, Surg., Gynec. & Obst. **72:** 568 (March) 1941.

9. Thompson, J. E.; Brabson, J. A., and Walker, J. M.: The Intra-Abdominal Application of Sulfanilamide in Acute Appendicitis, Surg., Gynec. & Obst. **72:** 722 (April) 1941.

10. Wangensteen, O. H.: Aseptic Resections in the Gastrointestinal Tract, Surg., Gynec. & Obst. **72:** 257 (Feb., no. 2A) 1941.

11. Lockwood, J. S., and Rhoads, J. E.: The Use of Sulfanilamide in the Treatment of Peritonitis, S. Clin. North America **19:** 1547 (Dec.) 1939.

12. Helmholz, H. F.: Urinary Infections in Infancy and Childhood, J. A. M. A. **111:** 1719 (Nov. 5) 1938. Colebrook, Leonard, and Kenney, M.: Treatment of Human Puerperal Infections and of Experimental Infections in Mice, Lancet **1:** 1279 (June 6) 1936. Bliss, Eleanor A.; Feinstone, W. H.; Garrett, A. W., and Long, P. H.: Sulfapyridine and Sulfanilamide in Experimental Pneumococcal, Meningococcal, Welch Bacillary and Friedländer's Bacillary Infections in Mice, Proc. Soc. Exper. Biol. & Med. **40:** 619 (April) 1939.

13. Lockwood, J. S.: Studies on the Mechanism of the Action of Sulfanilamide: III. The Effect of Sulfanilamide in Serum and Blood on Hemolytic Streptococci in Vitro, J. Immunol. **35:** 155 (Sept.) 1938.

14. Lockwood, J. S.: Sulfanilamide Therapy as an Aid to Surgery, Surg., Gynec. & Obst. **72:** 307 (Feb., no. 2A) 1941.

15. Lockwood, J. S.; Coburn, A. F., and Stokinger, H. E.: Studies on the Mechanism of the Action of Sulfanilamide: I. The Bearing of the Character of the Lesion on the Effect of the Drug, J. A. M. A. **111:** 2259 (Dec. 17) 1938.

have pointed out that there are hazards in using large amounts of sulfanilamide locally, for once the drug has been given its rate of absorption cannot be controlled and accidents may occur in sensitive patients.

Studies of the absorption of sulfanilamide by the peritoneum were carried out both on patients and on

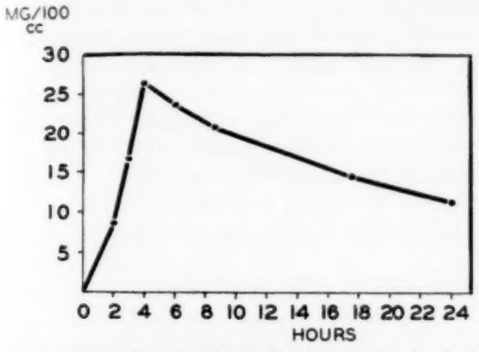

Chart 2.—Curve for absorption of sulfanilamide in dog 846 (weight 10 Kg.) following intraperitoneal implantation. Four Gm. of the drug, or 0.4 Gm. per kilogram, was given.

dogs. These studies were done on relatively normal peritoneal surfaces, and our figures may differ from those of investigators who have worked in the presence of peritonitis. Known amounts of sulfanilamide were placed in the peritoneal cavity and determinations of the sulfanilamide in the blood made at given intervals. Curves were drawn plotting the blood concentration against time. Absorption of the drug by the peritoneum is rapid. The amounts in the blood rise to high levels during the first two or three hours and fall off gradually to low levels at the end of twenty-four hours.

In dogs large doses per kilogram of body weight were employed. It seems that there may be a limit to the rate at which the peritoneum can absorb the drug, since the larger the dose the longer the interval before the peak is reached. Yet repeated experiments with doses up to 0.5 Gm. per kilogram (the equivalent of nearly 35 Gm. for a 150 pound [68 Kg.] man) showed the peak to be reached before four hours. Very high levels were reached in the dogs, the values going as high as 40 mg. per hundred cubic centimeters of blood. When these high levels were attained there were still significant amounts in the blood at the end

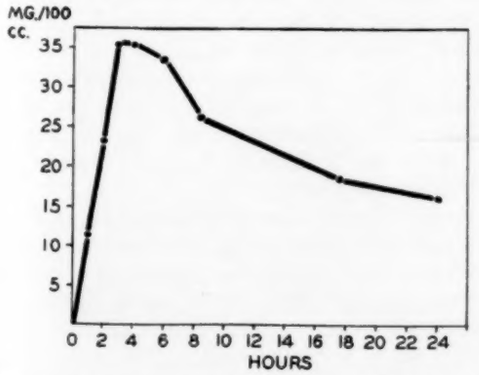

Chart 3.—Curve for absorption of sulfanilamide in dog 847 (weight 13 Kg.) following intraperitoneal implantation. Six Gm., or 0.46 Gm. per kilogram, was given.

of twenty-four hours, but at forty-eight hours the drug had nearly disappeared (charts 1, 2 and 3).

(To compare absorption from the intestine with that from the peritoneum, fasting dogs were given the same amount of sulfanilamide by stomach tube as had been given others of similar weight by peritoneum. When the drug was given into the peritoneum the peak was reached in three hours. When it was given into the stomach the level in the blood was still rising at twenty-four hours (chart 4).)

In an attempt to slow the absorption of the drug and maintain a high local concentration for a longer time, sulfanilamide was suspended in a tragacanth-aleuronat mixture similar to that used in preparing Steinberg's coli-bactragen [16] and injected into the dog's peritoneum. There was no appreciable slowing of the absorption (chart 5).

In human subjects doses greater than 5 Gm. of sulfanilamide were seldom used. Peak levels of nearly 10 mg. per hundred cubic centimeters were usually reached in about two hours, and at twenty-four hours levels below 2 mg. were found. There was considerable variation among individual subjects, for high levels of 16 to 18 mg. were observed in a few patients and relatively low ones in others (charts 6 and 7).

We have studied the records of 62 patients who have received sulfanilamide intraperitoneally during the past eighteen months at the University Hospital. There were three general indications for intraperitoneal admin-

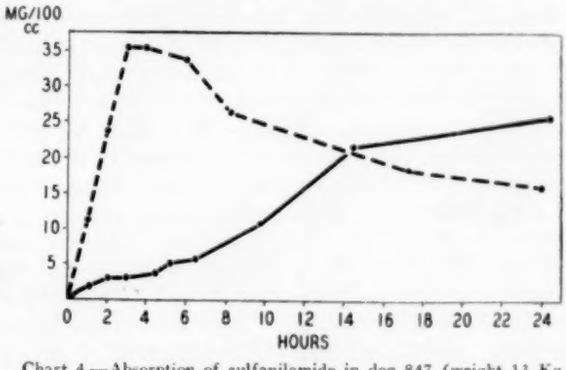

Chart 4.—Absorption of sulfanilamide in dog 847 (weight 13 Kg.; dose, 6 Gm. of powdered sulfanilamide given intraperitoneally) and in dog 937 (weight 12 Kg.; dose, 6 Gm. of the powdered drug given by stomach tube). The dotted line indicates the absorption of sulfanilamide from the peritoneum and the solid line the absorption from the intestine.

istration: operations in which spreading peritonitis was encountered or areas of intraperitoneal suppuration were entered; operations involving resection or anastomosis of the colon; operations on the upper portion of the gastrointestinal tract in which because of technical problems it was felt that the peritoneum had been soiled by intestinal contents. Several patients had stage operations, and the drug was used in them more than once, so that in the 62 patients sulfanilamide was implanted sixty-seven times (table 1).

The 62 patients can also be grouped on the basis of whether supplemental sulfanilamide medication was given. Thirty-three patients received no other chemotherapy, whereas 29 were given other sulfanilamide medication. All of the latter received sulfanilamide intravenously for at least one day postoperatively, and some received it orally later. Seven were prepared for operation by sulfanilamide medication (table 2).

In the 62 patients, whose chances of incurring peritonitis or of growing worse from established peritonitis were considered likely, only 5 had evidence of postoperative intraperitoneal suppuration. Two of the 5 were among the patients who received supplemental sulfanilamide. Of these 2, 1 with peritonitis compli-

16. Steinberg, Bernhard: Coli-Bactragen in Prevention of Peritonitis, Am. J. Clin. Path. 6: 253 (May) 1936.

cating appendicitis had a pelvic abscess but recovered after drainage and the other died of peritonitis when an open suture line at the site of an anastomosis between the stomach and the esophagus allowed continual peritoneal soiling attended with chemical necrosis. A third patient had peritonitis secondary to a wound infection

TABLE 1.—*Intraperitoneal Use of Sulfanilamide in Sixty-Seven Operations on Sixty-Two Patients*

	Number of Operations
Patients with anastomosis or resection of colon	33
Patients with anastomosis of stomach and small intestine (including 11 gastric resections)	15
Patients with peritoneal suppuration (including 12 cases of perforating appendicitis)	19
Total	67

appearing several days after sulfanilamide treatment had been stopped. The other 2 had gastric resections and received sulfanilamide only at operation. One recovered after drainage of a subphrenic abscess on the left side, and the other died, twenty-eight days after gastric resection, of a condition reported by the pathologist as low grade peritonitis. While this small series is uncontrolled, we feel that the use of sulfanilamide reduced the incidence of complications and failure which might have been expected and that the unfavorable results in 3 cases might have been averted by prolonged sulfanilamide treatment. Sulfanilamide medication is often attended by toxic reactions.[17] In our series none of the patients receiving only the intraperitoneal dose of the drug showed any toxic signs. Among the others there were frequent instances of cyanosis. Nausea could not be evaluated because of the type of patient. No cases of drug fever could be singled out. Granulocytopenia did not occur, and there were no drug rashes. But among the 29 patients who received additional sulfanilamide therapy one complication stood out glaringly, the development of jaundice in 9. It was definitely felt that the jaundice was due to hepatic damage in all instances, for there was no hemoclasis or sepsis to account for it otherwise.

Fortunately the development of icterus had no immediate untoward consequences. Except on one occasion

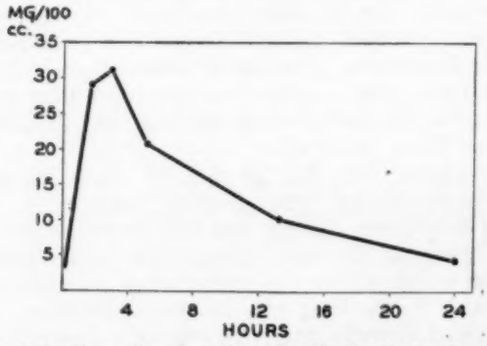

Chart 5.—Curve for absorption of sulfanilamide in dog 933 (weight 11 Kg.) following intraperitoneal implantation of 4 Gm. of the powdered drug suspended in a tragacanth-aleuronat mixture.

administration of the drug was stopped as soon as jaundice was noticed, and the jaundice rapidly cleared. The bilirubin level, determined by the van den Bergh method, varied from 2.5 to 20 mg. per hundred cubic centimeters, as compared with a normal of 0.1 mg. The reactions were direct, indicating a regurgitation type of jaundice. A patient who died a month and a half after operation of residual carcinoma and who had had jaundice which cleared showed no evidence of residual hepatic damage at autopsy. Data on the patient who became most deeply jaundiced are shown in chart 8. In her case because of extensive fecal soiling at operation the threat of peritonitis was considered so great that sulfanilamide medication was continued even after the jaundice had developed. The blood bilirubin level increased for several days after sulfanilamide therapy was stopped, but the jaundice eventually disappeared. Her postoperative course was otherwise gratifying, and after several months she showed no evidence of residual hepatitis.

Of the 9 patients in whom hepatitis developed none received more than 5 Gm. of sulfanilamide intraperitoneally, but 6 received additional sulfanilamide on the day of operation. The interval between operation and the appearance of jaundice varied from twenty-four hours to seven days (table 3).

Hepatitis has often been observed during sulfanilamide therapy.[18] Long and his associates [17] reported a 0.6 per cent incidence of jaundice in a series of 1,000

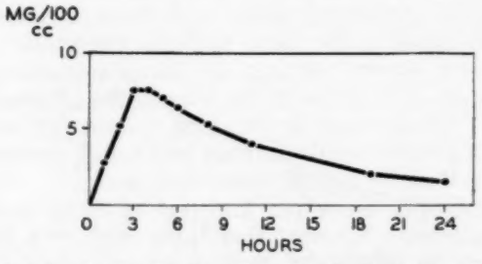

Chart 6.—Curve for absorption of sulfanilamide in W. S. (weight 120 pounds [54.4 Kg.]), who underwent partial colectomy for ulcerative colitis on Feb. 28, 1940. Four Gm. of sulfanilamide suspended in saline solution was placed in the peritoneal cavity.

patients. Watson and Spink [19] observed hepatitis in 16 of 110 patients, an incidence of 14.6 per cent. These authors included 2 fatal cases of jaundice which followed intraperitoneal implantation of the drug. In those cases the doses used were 10 and 12 Gm., respectively. The high incidence of jaundice in our small group seemed important to us. In analyzing the cases it appeared that jaundice was more common in the patients who received the most intensive therapy and probably had the highest levels of drug in the blood. The question arose whether the intraperitoneal application of the drug might be more apt to lead to hepatitis than administration by other routes.

Dogs were given sulfanilamide intraperitoneally, and at various intervals the portal vein was exposed and blood specimens were withdrawn simultaneously from it and from the jugular vein. Attempts to cannulate the portal vein and obtain serial specimens were unsatisfactory, and so a series of isolated experiments was

17. Long, P. H.; Haviland, J. W; Edwards, L. B., and Bliss, Eleanor A.: The Toxic Manifestations of Sulfanilamide and Its Derivatives, J. A. M. A. **115**: 364 (Aug.) 1940.

18. de Bonis, G.: Toxicity of Sulfanilamide for the Liver, Athena **9**: 225 (Aug.) 1940; abstr., J. A. M. A. **115**: 1928 (Nov. 30) 1940; Garvin, C. F.: Toxic Hepatitis Due to Sulfanilamide, ibid. **111**: 2283 (Dec. 17) 1938; Ottenberg, R., and Berck, M.: Sulfanilamide for Suppurative Pylephlebitis and Liver Abscess, ibid. **111**: 1374 (Oct. 8) 1938; Cline, E. W.: Acute Yellow Atrophy of the Liver Following Sulfanilamide Medication, ibid. **111**: 2384 (Dec. 24) 1938; Hageman, F. O., and Blake, F. G.: A Specific Febrile Reaction to Sulfanilamide: Drug Fever, ibid. **109**: 642 (Aug. 28) 1937; Bannick, E. F.; Brown, A. E., and Foster, F. P.: Therapeutic Effectiveness and Toxicity of Sulfanilamide and Several Related Compounds, ibid. **111**: 770 (Aug. 27) 1938.

19. Watson, C. J., and Spink, W. W.: Effect of Sulfanilamide and Sulfapyridine on Hemoglobin Metabolism, Arch. Int. Med. **65**: 825 (April) 1940.

done. The fact that a large number of experiments was not carried out probably detracts from the accuracy of our figures. These studies revealed that during the absorptive phase the concentration of sulfanilamide was considerably higher in blood from the portal vein than in the peripheral blood. Thirty minutes after the

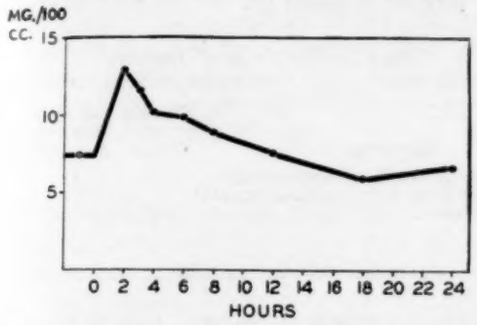

Chart 7.—Curve for absorption of sulfanilamide in H. P. (weight 142 pounds [64.4 Kg.]), who underwent ileotransverse colostomy for carcinoma of the cecum on April 22, 1940 and was prepared for operation by the oral administration of sulfanilamide for three days. At the time of intraperitoneal implantation (5 Gm. was given) there was a level of sulfanilamide in the blood of 7.3 mg. per hundred cubic centimeters.

administration of the drug the difference between the sulfanilamide content of the portal vein blood and that of the peripheral blood was approximately 40 per cent of the peripheral blood level (chart 9). At the end of four hours the concentrations were the same.

This initial high concentration of sulfanilamide in blood from the portal vein when the drug is absorbed by the peritoneum may cause more insult to the liver than is caused when the drug is absorbed more slowly. Greene and Hotz [20] reported on a patient with hepatitis following sulfanilamide medication who died and was autopsied. Tissue assays were made, and it was found that a concentration of 6 mg. per hundred grams was present in the liver, as compared with a concentration

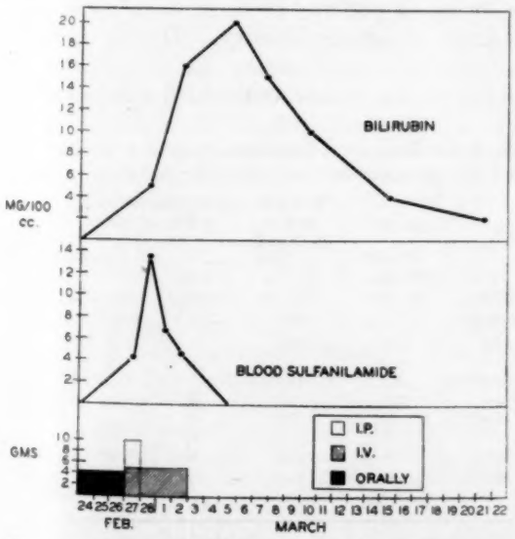

Chart 8.—Levels of bilirubin and of sulfanilamide in the blood in L. S. Deep jaundice developed in this patient twenty-four hours after the intraperitoneal implantation of sulfanilamide. She was prepared for operation by sulfanilamide medication, which is represented in the lower part of the chart. Operation was on February 27. *I. P.*, intraperitoneal medication and *I. V.*, intravenous medication.

of 1 mg. per hundred grams in the lungs. These authors suggested that there is perhaps a special affinity of the liver for the drug. If this is so, the passage of high concentrations in the portal vein during the early stages of absorption may allow the liver to saturate itself with more sulfanilamide than it can safely handle in the face of subsequent medication. In our investigations no tissue assays were made. Sections of liver from dogs who received the drug intraperitoneally were examined microscopically and failed to show significant or specific changes which could be attributed to sulfanilamide.

Another interesting phase of the intraperitoneal implantation technic is the local mechanical effect of the sulfanilamide. During the period of absorption from the dog's peritoneum samples of peritoneal fluid were aspirated through capillary pipets and examined microscopically. There was no cellular response. Up to two hours later sulfanilamide crystals were found in the fluid, but none were found thereafter. Animals which had been given sulfanilamide intraperitoneally were killed from four hours to one month later and their abdominal cavities examined. In those killed after four hours small amounts of fluid were observed but there was no hyperemia and no exudate or crystals. In those killed later the peritoneal surfaces appeared entirely normal. No adhesions were formed. On microscopic examination of the serosal surfaces no variation from normal could be detected.

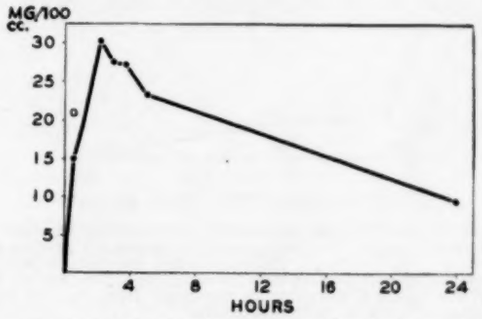

Chart 9.—Level of sulfanilamide in the blood of dog 942 (weight 12 Kg.). The small circle charted at one-half hour represents the value for sulfanilamide in portal vein blood; the other points on the chart indicate values for jugular vein blood.

On the other hand, there is some reason to believe that sulfanilamide therapy may do much to prevent peritoneal scarring. Two patients treated intraperitoneally with sulfanilamide for diffuse purulent peritonitis died of other causes and have subsequently been seen at autopsy. In each instance it seemed remarkable that the angry process seen at operation had subsided without more adhesion formation. In each case the only gross evidence of the previous peritonitis was a single fine adhesive band. It is likely that chemotherapy alters the peritoneal reaction in infection. We have seen abscesses rendered sterile by sulfanilamide and its derivatives. Recently we treated a patient with staphylococcic septicemia and acute osteomyelitis, using sulfathiazole. The patient later had pericarditis with an effusion from which staphylococci were obtained by smear and culture. Yet typical purulent pericarditis never developed, for the effusion never contained more than 3,000 white blood cells per cubic millimeter. Eventually the effusion disappeared and the blood culture became sterile. It remains to be seen whether any permanent pericardial changes have occurred, but it is reasonable to suppose that there will be less scarring than there would be if the exudate had contained much fibrin and large numbers of pus cells. In the same way sulfanilamide may modify the process of inflam-

20. Greene, C. H., and Hotz, R.: Liver and Biliary Tract: Review for 1938, Arch. Int. Med. **63**: 779 (April) 1939.

mation in the peritoneum and, in addition to allowing recovery of the patients by controlling the infection, reduce the incidence of scarring with the formation of adhesions during the healing phase.

Another series of experiments was carried out in an attempt to evaluate sulfanilamide therapy in experimental peritonitis. Fecal peritonitis was induced in one group of 24 dogs. A fecal suspension was prepared by taking a weighed amount of fresh cage feces, suspending it in saline solution and filtering it through gauze. This was injected into the peritoneal cavity through a trocar. Experiments were all carried out on dogs in pairs, one dog being protected with sulfanilamide and the other being used as a control. The dogs were inoculated with equal doses varying from 1.5 to 5 Gm. of feces suspended in 50 cc. of saline solution. Four Gm. of sulfanilamide powder suspended in 100 cc. of saline solution was injected into the peritoneal cavities of the protected dogs and 100 cc. of plain saline solution into the cavities of the controls. It was not possible, in working in this fashion, to standardize the fecal inoculum, the dose being more virulent on some occasions than it was on others.

There were twelve paired experiments. In 4 the protected dog survived and the control died. In 1 both animals survived. In the 7 other experiments both

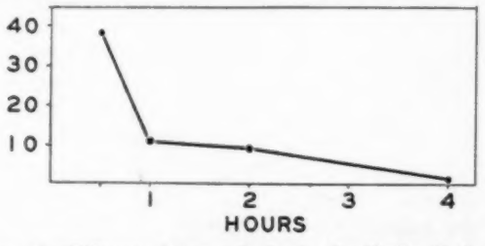

Chart 10.—Difference between the levels of sulfanilamide in portal vein blood and those in jugular vein blood, the sulfanilamide having been given intraperitoneally. The points on the chart were obtained by averaging the results of various experiments and represent the percentage of difference between the levels of the drug in specimens from the two sources withdrawn simultaneously at various intervals.

animals died, but the average survival time of the protected animals was twenty hours while that of the controls was twelve hours. This cannot be accepted as anything but suggestive evidence of the value of sulfanilamide treatment.

In an effort better to control the degree of infection, colon bacillus peritonitis was induced in another group of animals. The method of Steinberg and Goldblatt [21] was used, various amounts of agar cultures of Escherichia coli (colon bacillus 300—Steinberg) being suspended in a tragacanth-aleuronat mixture. Thirty animals were employed in groups of 6, 3 in each group being protected with sulfanilamide, as in the group with fecal peritonitis, and the other 3 being used as controls. Doses of Esch. coli ranged from one half to one twenty-fifth of a twenty-four hour slant. Actually more control animals than treated animals survived. Possibly the use of the tragacanth-aleuronat mixture interfered with the usual action of sulfanilamide. Tragacanth is supposed to prevent by some mechanical action the rapid transport of the colon bacilli into the blood stream. This may interfere with the action of the drug either mechanically or because of some inhibitor substance.

Various conclusions may be drawn from these observations. In the first place, we feel that results were gratifying in our group of patients who were treated intraperitoneally with sulfanilamide either to prevent or to overcome peritoneal infection.

Absorption of sulfanilamide from the peritoneum free of suppuration is rapid. It may be slower from the cavity of an appendical abscess, and there is every reason to suppose it would be. In the relatively normal abdomen the absorption is so rapid it is doubtful that the local use of sulfanilamide in the peritoneum is analagous to its local use in parts of the body where absorption is slower. It would be ideal if some method could be devised which would prevent the rapid absorption of the drug and allow it to remain in a higher local concentration. Perhaps more reasonable would be use of some allied compound with the same action which would be absorbed less readily and remain effective in the local sense longer.

Countering the rapidity of absorption from the peritoneal cavity is the fact that peritoneal administration offers the fastest method we know to raise the concentration in the blood to effective levels. If a spreading peritonitis is found at operation or if, because of technical difficulties, unforeseen contamination occurs, it is desirable to get effective chemotherapy started as soon as possible. If not overdone, intraperitoneal implantation is a fairly safe and extremely rapid method of administering sulfanilamide.

In the group of patients reported here there was a high incidence of hepatic damage. During the rapid absorption from the peritoneum the concentration of sulfanilamide in the portal vein blood reaches higher levels than are reached when the drug is administered by other routes, and this may increase the danger of hepatitis. At least this incidence of jaundice emphasizes a hazard of intraperitoneal chemotherapy with too large amounts of the drug. In retrospect it seems that several of our patients in whom jaundice developed were given too much sulfanilamide on the day of operation. After an intraperitoneal dose of 5 Gm. of sulf-

TABLE 2.—*Incidence of Jaundice*

Dedication	Number of Cases	Number of Cases of Jaundice	Incidence
Sulfanilamide given only intraperitoneally.....	33	0	0
Sulfanilamide given orally and supplemented intraperitoneally.....	29	9	31%
Total.....	62	9	14.5%

TABLE 3.—*Data on Chemotherapy and Jaundice*

Patient	Clinical Jaundice	Blood Bilirubin, Mg. per 100 Cc.	Sulfanilamide in Blood, Highest Level, Mg. per 100 Cc.	Sulfanilamide* Given on Day of Operation, Gm.		Postoperative Interval Before Jaundice, Days
				Intraperitoneally	Intravenously	
L. S.	4+	20.0	13.5	5	5	1
M. D.	2+	3.5	....	5	5	6
S. H.	3+	2.5	16.6	5	..	4
R. G.	3+	3.5	2.8	5	..	5
H. F.	2+	...	7.7	5	..	7
F. B.	3+	+	...	5	10	2
E. W.	3+	+	11.1	5	5	3
E. J.	3+	+	12.2	5	8	3
H. P.	3+	4.5	....	5	2 (orally)	3

* These 9 patients all received supplemental medication.

21. Steinberg, B., and Goldblatt, H.: Studies on Peritonitis: Passage of Bacteria from the Peritoneal Cavity into the Lymph and Blood, Arch. Int. Med. **39**: 449 (March) 1927.

anilamide an interval of eighteen hours or more should elapse before further medication. In face of active infection it would seem wise to continue sulfanilamide treatment to obtain optimum results. When sulfanilamide is used prophylactically additional medication should depend on the clinical estimate of the degree of contamination and the power of the patient to resist it. Fortunately, no deaths due to hepatitis occurred in our series, and likely this is because larger doses were not used. From our experience we would be loath to use amounts of sulfanilamide much greater than 5 Gm. in the peritoneal cavity.

SUMMARY

1. The local implantation of sulfanilamide is of value in treating peritonitis and in aiding the peritoneum to overcome contamination occurring at operation.

2. Sulfanilamide is absorbed so rapidly from the peritoneal cavity that it is uncertain whether it is effective as a local medication in the same sense that it is in other parts of the body.

3. The peritoneal route offers the fastest method of administering the drug so that effective levels in the blood are reached.

4. There was a high incidence of hepatitis in the patients in this series, and the administration of doses larger than 5 Gm. is advised against.

5. There is no evidence that the local application of sulfanilamide injures the peritoneal surfaces, and it is suggested that chemotherapy offers promise of reducing scarring (adhesion formation) in the peritoneum secondary to pyogenic infection.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MUELLER AND THOMPSON AND DRS. JACKSON AND COLLER

DR. HENRY W. CAVE, New York: We have had at the Roosevelt Hospital a large experience with acute appendicitis. There were 742 patients suffering from this disease from 1935 to 1939, and in the past fifteen months there were 268 patients, 90 of whom were treated with sulfanilamide intraperitoneally without a single death. In only 1 instance in the entire series of 90 cases was there jaundice. The approximate dose was 12 Gm. per patient or 170 mg. per kilogram of body weight, and the sulfanilamide powder was placed in sterile test tubes, usually 2, 4, 6 and 8 gram doses, and sterilized by dry heat for two hours at 140 C. The peak of the blood level is reached in ten to eighteen hours. Generally, after two hundred hours no trace of sulfanilamide is found in the blood. There have been noted no toxic manifestations from intraperitoneal sulfanilamide in this series of over 200 patients. Also there has been no evidence of liver damage. The blood concentration is not important in peritoneal infections, but we are convinced that high local peritoneal concentration is important and is an active factor in controlling the disease. I am not convinced that peritoneal concentration is as of short duration as Drs. Jackson and Coller stated. We have demonstrated a peritoneal concentration as high as 600 mg. as long as thirty-six hours after operation. In other words, rapid fall in the blood level postoperatively is not paralleled by the fall in the peritoneal level. We have encountered, even three days postoperatively, sulfanilamide crystals in the peritoneal exudate. The 90 patients were all critically ill. All of these patients were immediately operated on. It is interesting that in Drs. Jackson and Coller's series the only patients acquiring jaundice were those who had daily received intravenously large doses of sulfanilamide in addition to the original peritoneal dose. I believe that if a sufficiently large intraperitoneal dose is used at operation it is not necessary to give sulfanilamide compounds by rectum, by mouth or intravenously. Thus, toxic symptoms are unlikely to occur. It has been stated in both of these papers that sulfanilamide has been used in peritoneal infections other than acute suppurative appendicitis and as a preventive of infection within the peritoneum in all forms of resections of the intestine, end to end, side to side, end to side anastomoses, after hysterectomy and other abdominal operations. It has been my own practice to place around anastomoses inside the abdomen 4 to 6 Gm. of sulfanilamide crystals for their bacteriostatic effect. In some 5 cases of ulcerative colitis in which a subtotal colectomy was done we placed sulfanilamide in the peritoneal cavity; even in spite of this there were two deaths from peritonitis in this series of 5 in which we had used the drug.

DR. JAMES E. THOMPSON, New York: Dr. Mueller has shown a dramatic reduction in mortality from acute appendicitis following the introduction of sulfanilamide as an adjunct in the treatment of acute appendicitis with perforation. The effect of sulfanilamide is emphasized also by a reduction in such complications as secondary peritoneal abscesses; wound complications also were less, and we found that prolonged wound drainage was less. We have used sulfanilamide in a total of 90 cases as a prophylactic measure in surgery of the large intestine when there has been gross or suspected contamination, and in these we have had eight deaths. We have also used it as a therapeutic measure in 21 cases in which we have encountered peritonitis from causes other than acute appendicitis and have had six deaths, a rather staggering mortality rate; but these were unusually serious cases. The blood levels were taken in all our original cases, but only recently did we begin to get peritoneal levels in a few of our serious cases of appendicitis with peritonitis. A test tube is attached to one of the drains (if it was drained with two drains), a clamp put on the other one, and the collected fluid drained off from it. In 1 case at the end of seventeen hours the fluid was analyzed and found to contain 200 mg. of sulfanilamide per hundred cubic centimeters. In 1 case of perforated appendicitis with peritonitis, at the end of three hours we got a level as high as 880 mg. per hundred cubic centimeters, which dropped down at the end of five hours to around 200. In a case of acute appendicitis with abscess formation, in which we have placed 6 Gm. of sulfanilamide into an abscessed cavity around the cecum, 12 Gm. was placed in it. The abdominal wall was closed snugly about the drain. There was a prompt rise at the end of three hours to around 400 mg. per hundred cubic centimeters. It then reached the peak, which was around 780 mg. and dropped down again, going up at the end of thirty-six hours to 660 mg. Our culture at operation was a pure culture of Bacillus lactis aerogenes, while a culture at the end of thirty-six hours showed B. lactis aerogenes and the gamma streptococcus. The appearance of the streptococcus in a secondary culture has been rather frequent in our experience. Two features are evident: (1) that one can get a fairly well maintained local level of sulfanilamide for a period as long as thirty-six hours postoperatively and (2) that the sulfanilamide does not act as a true bactericidal agent but probably as a bacteriostatic one.

DR. ALTON OCHSNER, New Orleans: Our results have not been as dramatic as Drs. Mueller and Thompson's. We have observed some cases of jaundice and have seen some bad results from the implantation of sulfanilamide in the abdominal wall because of the exudation which is set up. Undoubtedly, many of these wounds can and will heal better with sulfanilamide than if allowed to become infected; still I think it should be emphasized that, unless there is gross contamination, sulfanilamide should not be used. Sulfanilamide produces an intense reaction of the wound, excessive exudation of serum and a prolonged healing. I should like to call attention to the advisability of not draining the peritoneal cavity in cases of generalized peritoneal infection or contamination. Dr. John Yates demonstrated experimentally almost forty years ago that it is impossible to drain the peritoneal cavity per se for longer than four to six hours, because after this time the drains become walled off and drainage is only along the course of the drain. A

number of years ago while serving as an exchange assistant in the Zurich Surgical Clinic I had an opportunity to compare the results obtained in cases in which the peritoneal cavity was drained with those obtained in cases of peritonitis in which no drainage was used. During the time Professor Sauerbruch was director of the clinic drainage was done in all cases, whereas during Professor Clairmont's tenure drainage was not done in the presence of generalized peritonitis. It is of significance that the incidence of residual abscess formation was considerably higher in the cases in which drainage was used prophylactically. This is undoubtedly due to the fact that the drain as a foreign body increases the peritoneal reaction and tends to produce pocketing. I think that, if one is to use sulfanilamide, drainage should not be used in the peritoneal cavity. I was interested in Dr. Mueller's statement that they were using sulfathiazole in conjunction with sulfanilamide. A word of warning about the use of sulfathiazole in serous cavities. I know of 2 cases with optic lesions, 1 a permanent optic atrophy, which resulted from sulfathiazole administration in sepsis and another a temporary optic lesion following sulfathiazole implantation in the pleural cavity. Whether this is a coincidental finding and what the connection is I don't know, but we have learned to fear sulfathiazole given intraserously, probably because of the rapid absorption. Would it not be better to use possibly not as large a dose as Drs. Mueller and Thompson used, namely 12 Gm., but a smaller dose, as Drs. Jackson and Coller suggested, and repeat that in another four to five hours?

DR. FREDERICK A. COLLER, Ann Arbor, Mich.: We have heard two presentations dealing with the curative aspects of sulfanilamide, the other, Dr. Jackson's, discussing largely the preventive aspects. We do know from past work that if there is an exudate in the peritoneum there will be a sharp limitation of absorption, and the facts presented by Drs. Mueller and Thompson bear that out very well. Those facts have been proved before. One cannot gainsay the evidence as presented by Dr. Jackson that in the normal peritoneum, whether in the experimental animal or whether one is using it in the comparatively normal peritoneum that has been contaminated, the absorption is more rapid and lasts for a very much shorter time. We have examined microscopically and grossly the peritoneum of many animals that have had enormous amounts of sulfanilamide placed there both in solution and as a powder, and we have yet to find any evidence of harm that has accrued to the peritoneum from the presence of even enormous amounts of the powder itself. The drug is not a panacea. I am sure, in operating on patients with peritonitis and acute appendicitis and with abscess that the proper time for operation was chosen, due thought was given to the type of anesthetic, and the chemical abnormalities of the patient were carefully corrected. We must emphasize the fact that chemotherapy is an adjunct to good surgery and will not replace it. I find that many physicians are now using these various drugs in all clean operations. Some one asked me the other day why it would not be a good idea to sprinkle it in the wound after a radical mastectomy. Those wounds do well if they are done with the good surgery that we already know about. I think it unwise to use these chemicals in the hope that they will improve what otherwise might be called inadequate surgery. There is one point that I should like to mention in closing (Dr. Ochsner has already mentioned it), and that is our use of these chemicals in the contaminated abdominal wall. Many times, let us say, we operate on a colon, the clamp slips, and we deal with a contaminated peritoneum. Certainly we shall use sulfanilamide there and shall expect some help from it. On the other hand, if the virgin abdominal wall that has never been in contact with infection of any kind until the incision is made is contaminated with the contents of the colon, it has been suggested that these chemicals be used in the wall. My experience is just exactly that mentioned by Dr. Ochsner, that it makes a messy wound, no matter how one uses it. These salts are hygroscopic, and they have a peculiar glazing or coagulating action on the fat of the subcutaneous tissue which I do not like.

DR. F. L. REICHERT, San Francisco: The use of chemotherapy in the peritoneal cavity brings up the question as to what happens when a powder is placed in it. The interesting fact that was brought out in the discussion as well as in Drs. Jackson and Coller's paper was that they experimentally, in normal animals, found that there was no reaction whatever to the use of sulfanilamide. Dr. Laird and Dr. Stavern, in the surgical research laboratory at Stanford, have placed the powder of sulfanilamide and of sulfathiazole intraperitoneally into normal dogs and have found in general that there has been no reaction in the peritoneum or in the omentum but that there has been some reaction in the wound of the abdominal wall. When sulfathiazole was used, about 0.5 mg. per kilogram, there was some induration of the root of the mesentery. There were no adhesions, but in the abdominal wound there was considerable secretion. They also used sodium sulfathiazole and found severe reaction, with adhesions and matting together of the loops of bowel and mesentery. Sodium sulfathiazole has a p_H of about 11, whereas sulfanilamide and sulfathiazole have a neutral p_H of about 6.3 or 6.5. From their experimental work I think one is justified in using sulfanilamide and sulfathiazole powder intraperitoneally; certainly not sodium sulfathiazole.

DR. MISCH CASPER, Louisville, Ky.: I have used sulfonamide agents in many cases of ruptured appendix and acute peritonitis. I used it once in a perforated stomach that was seen after twenty-four hours' delay, the perforation being due to a stab wound, one perforation on the anterior wall of the stomach and two in the lesser sac. The peritonitis was limited to an area about 8 or 10 inches in diameter, and sulfathiazole was used in this case without any bad results. It looked like a good case in which to try it, because there was developing already a definite area of peritonitis, which may have been a chemical form of peritonitis. Also sulfathiazole was used in 1 case of cesarean section. It had been a badly handled case before it came to the hospital. It had been examined and reexamined by no fewer than five doctors. We contented ourselves with placing sulfathiazole into the emptied uterus, also on the peritoneal line of stitches on the uterus and in the wall. I do not remember any similar case reported before. The patient came through without any elevation of temperature and with a normal recovery. We have lately been using sulfathiazole instead of sulfanilamide. We used only 7 Gm.; that is the highest amount we have used in the abdomen, and 2 in the wall. I feel sure that in these sulfonamide drugs we have one of the greatest agents for cure in all time, ranking certainly with the ten most useful drugs. We have had no cases of jaundice following this procedure. That may be because we use a smaller dose than some of the others. I should like to call attention to an old professor's saying that anything that is potent for good is also potent for evil; hence, no doubt cases in which the sulfonamides are used rather indiscriminately will show up some evils in the future, and we must watch out for those.

DR. R. STERLING MUELLER, New York: In our series of cases from Roosevelt Hospital we have used it in only the severe cases. We would not use it in a clean or only slightly contaminated case. But if one is going to use it in the abdominal wall in an undrained case in which there is slight contamination, one must be sure to spread the drug around, to deposit it around the wound so that it does not form a mass in one spot, because those cases especially will show a reaction. I also want to warn against using sulfanilamide intraperitoneally in those cases in which sulfanilamide compounds have been used preoperatively. We feel that the advantage of the larger dose makes it unnecessary to give it postoperatively. In the last few months there have been but few cases in which we have given it after operation. I think that if one does give it in cases in which it was used preoperatively, and especially in those cases in which it is used postoperatively by the intravenous route, one might see jaundice. In reply to Dr. Ochsner's suggestion about giving it at two different times four or five hours apart, I do not believe that would help any. We prefer giving the larger dose. We believe that the fibrin which masses around the crystals prolongs its absorption.

CESAREAN SECTION

INDICATIONS FOR AND RELATIVE MERITS OF THE CLASSIC, LOW AND EXTRAPERITONEAL OPERATIONS

S. A. COSGROVE, M.D.
AND
J. F. NORTON, M.D.
JERSEY CITY, N. J.

The indications recognized as valid in modern practice for the exhibition of cesarean section are numerous. Historically, this operation has been employed only for high degrees of fetopelvic disproportion. Indeed, until about fifty years ago its validity on any other grounds was not recognized. Up to that time it was so dangerous as to be applicable only to what was known as the absolute degree of pelvic contracture, because of which not even a mutilated dead baby could be otherwise removed from its mother's body, and the relative degree of contracture, which meant that a living baby could scarcely be otherwise delivered.

In the last forty to fifty years, however, the term relative disproportion has become so liberalized as to connote any degree of fetopelvic disproportion which makes vaginal delivery unusually difficult or carries more than a minimum hazard for the baby's survival in vaginal delivery. This trend, while undoubtedly conservative in expert hands, has been pernicious in the hands of the occasional operator lacking the obstetric capacity adequately to judge corollary conditions affecting individual situations.

Paralleling the more liberal attitude involving the fetopelvic relation of size is the use of cesarean section for other mechanical interferences with labor, such as malpresentation, occasional factors of dystocia of the soft parts of the birth tract and tumors extrinsic to the uterus.

Another group of indications comprises nonmechanical abnormalities peculiar to the pregnant state, such as certain types of placenta previa, abruptio placentae and severe, rapidly progressive toxemia.

Still another group involves disease conditions in the mother not primarily dependent on the pregnancy, such as tumor of the uterus or other organs not necessarily mechanically obstructing labor but indicating from its nature operative ablation, rare cases of heart disease, diseases of the central nervous system and acute infectious diseases.

All the foregoing groups of indications are today generally accepted as valid provided that treatment in individual cases is determined with average good obstetric judgment. There are many other indications, however, for which cesarean section has been not infrequently used, such as primigravidity in the elderly, election by neurotic patients and high social value of the offspring, which can hardly be considered legitimate unless assessed with an extraordinary degree of conscientious thought and obstetric competence in individual cases.

With reference to what has so far been said, therefore, cesarean section should ordinarily not be undertaken at all except with the concurrence of at least two physicians, one of whom should be, if possible, an obstetrician of acknowledged competence and experience. This rule should govern its employment according to definite regulations in all properly organized hospitals.

A brief tracing of the history of the operation indicates that up to the period of anesthesia and antisepsis the technic was exceedingly crude and not designed to cope successfully with the hazards of hemorrhage and infection. It was only when antisepsis and asepsis were applied to surgery and Sanger pointed the way toward adequate control of hemorrhage by careful suture of the uterine incision that the expansion of the availability of the operation as already sketched was possible. Sanger's operation, which involved a high paraumbilical incision of the parietes and a uterine incision placed longitudinally about in the midline of the corporeal segment of the uterus, well up toward the fundus, has become known as the classic type of cesarean section. Great as was the improvement of this technic on the older ones, however, it has several serious inadequacies. Spill of uterine contents and blood into the peritoneal cavity cannot be avoided, even by the most careful packing about the uterine incision; moreover, this spill involves the upper, less resistant portion of the peritoneum. The incision in the uterus involves the thickest and generally most vascular portion thereof. Hemorrhage is apt to be relatively profuse and accurate coaptation by sutures difficult. As a result, healing by first intention is frequently imperfect and a weak scar remains in the portion of the uterus which is called on to do the most work in a subsequent delivery. Hence the incidence of rupture of the scar, both in our own experience and in experience reflected in many published series, has been high. The dangers inherent in rupture have therefore to be assessed against the indications for the original operation in cases in which it occurs.

TABLE 1.—*Classic Section, Sixty-Eight Cases*

61 cases of operation, with intact membranes and no labor	Days of Morbidity										Total	Percentage of Morbidity
	2	3	4	5	6	7	8	9	10	Over 10		
	8	6	4	2	0	1	0	0	7	2	30	44.1

In earlier experience of cesarean section, the tendency to employ it as a late necessitous procedure on patients already infected by prolonged labor and mishandling led to a high death rate from peritonitis. Numerous attempts were therefore made to devise technics that would lessen the risk. The first important contribution to the evolution of operative technic was the operation of Porro. This operator eventrated the whole organ, emptying the uterus and then amputating it at the level of the junction between the body and the neck. The peritoneum was secured about the cervix, and the stump of the cervix was exposed in the parietal incision. This operation definitely diminished the risk of peritonitis but involved the loss of the uterus and the shock attending so formidable a procedure. It is still occasionally used for its original purpose of avoiding peritoneal infection in cases in which the removal of the uterus is necessitated by a concurrent pathologic condition. In more recent practice it has been modified by peritonealizing the cervical stump and dropping it back into the pelvis.

About thirty years ago numerous technics were proposed for approaching the uterus beneath the perito-

From the Margaret Hague Maternity Hospital.
Read before the Section on Obstetrics and Gynecology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

neum, with the thought of lessening the risk of peritoneal infection and at the same time conserving the uterus. Out of those attempts there have evolved a number of operations, which fall into two types. The first type, true extraperitoneal operations, includes the Latzko operation, in which a paramedial incision is made just above the symphysis, the bladder mobilized to the right (mainly by blunt dissection), the peritoneum displaced upward and the uterus entered by a vertical or a diagonal incision in the lower segment well down to the vaginal reflection from the cervix. The technic is not too difficult for any competent and experienced obstetric surgeon. It does, however, involve some danger of injuring the bladder near the base and some possibility of injuring the ureter. It is somewhat restricted in the space available for removal of the baby. In spite of these potential drawbacks, however, large babies have been successfully extracted by it, and our results with the operation have been exceedingly good in spite of a few technical accidents.

The only other type of true extraperitoneal section with which we have had experience is that developed by Waters in our clinic. In it the lower uterine segment is approached to the left of and above the bladder, a wide exposure of it being made through which a generous transverse semilunar incision can be made which permits easy extraction of even a large baby. The dissection in this operation is entirely away from the base of the bladder, the ureter and the large vessels of the parametrium. We have been highly successful with it. Some of our staff prefer it to the Latzko operation, whereas others continue to use the Latzko.

A kind of compromise type of operations is represented by several technics of so-called peritoneal exclusion. In such operations the approach is by the peritoneal cavity, restricted areas of which are closed off by artificial approximation of parietal and visceral layers from the general cavity before the incision is made in the uterus. While the principles of these operations appeared relatively early, recent modifications of them have been proposed from several clinics. Thus Irving reported the use of the Hirst operation, in which after vertical incision of the parietes the uterine and parietal layers are sutured to each other about a proposed vertical line of incision in the uterus, the peritoneal suture line being reinforced by a tier of fascial sutures. Cook approximated the round ligaments to the parietal peritoneum, thereby walling off a roughly quadrangular space low down on the uterus. Smith made his approach through a Pfannenstiel incision, incising the parietovesical and vesicouterine layers of peritoneum close to the bladder and completely amputating a small cap of peritoneum over the fundus of the bladder. These layers are then carefully sutured. The bladder is mobilized, and the uterus is approached by transverse incision through the lower uterine segment.

All the operations mentioned have the initial objection of opening the general peritoneal cavity widely, of being somewhat time consuming because of the extra amount of suturing used preliminary to opening the uterus and inviting in the case of Cook's operation a localized peritonitis which prolongs the hospital stay of the patient, and in operations of the first type of placing dependence on a suture line which readily tears with the extraction of the baby and the retraction of the uterus. The introduction of the fascial tier of sutures in Irving's modification is directly necessitated by this risk.

Shortly after the attempts to develop true extraperitoneal operations, a number of surgeons attempted to refine the Sanger operation by approaching the uterus through the lower segment, where bleeding is less, where it is feasible to cover the incision by two layers of peritoneum and where the scar of the incision will not be so disturbed in future labors. Of all technics developed on this basis the best known are those of De Lee, Beck, Munro-Kerr and Phaneuf. The bladder is mobilized from the lower uterine segment by incision through the vesicouterine peritoneum, and the lower uterine segment is incised vertically or transversely. We believe, in spite of the adherence of many capable operators to the Sanger operation, somewhat modified in most cases by a subumbilical incision of the parietes and by placing the uterine incision as low as possible without disturbing the relation of the bladder to the uterus, that the operations which most truly confine the incision in the uterus to the lower segment are preferable to those which involve mainly the corporeal segment. For this reason, in recent years we have preferred in most cases the transverse lower segment operation.

From what has been said in the foregoing brief sketch of the various operations concurrently in use in this

Table 2.—*Low Cervical Sections: Total Analyzed 637; Vertical 127 and Transverse 510*

Hours in Labor with Membranes Ruptured	Days of Morbidity											Percentage of Morbidity	
	0	2	3	4	5	6	7	8	9	10	Over 10		
0-1	225	76	57	31	17	8	9	10	3	1	11	223 of 448	49.8
2	3	1	1	0	1	0	0	0	0	0	0	3 of 6	50
3	5	4	0	1	0	1	0	1	0	0	0	7 of 12	58.3
4	6	3	0	0	1	0	0	0	1	1	0	6 of 12	50
5	5	2	2	0	0	0	0	0	0	0	0	4 of 9	44.5
6	11	2	2	2	0	1	0	0	0	0	0	7 of 18	58.9
7	3	1	0	0	0	1	0	1	0	0	0	3 of 6	50
8	6	2	1	0	0	1	0	0	0	0	0	4 of 10	40
Total	264	91	63	34	19	12	9	11	4	2	11	257 of 521	49.3

Table 3.—*Extraperitoneal Cesarean Section (Total Cases Analyzed, Two Hundred and One)*

Hours in Labor with Membranes Ruptured	Days of Morbidity											Percentage of Morbidity	
	0	2	3	4	5	6	7	8	9	10	Over 10		
25 - 30	12	3	2	1	2	1	2	1	2	4	..	18 of 30	60
31 - 35	3	1	3	2	0	1	0	1	0	0	..	8 of 11	72.7
36 - 40	2	3	3	0	1	2	0	0	0	0	..	9 of 11	81.8
40 -120	11	4	4	3	1	5	2	4	2	7	..	32 of 43	74.4
Total	28	11	12	6	4	9	4	6	4	11	..	67 of 95	70.5

Table 4.—*Maternal Mortality from Classic Section in Sixty-Eight Cases*

Condition of Patient	Deaths
Admitted moribund with lobar pneumonia	1
Had carcinoma of breast; admitted with advanced carcinomatosis	1
Died on operating table from cardiac collapse	1
Had pulmonary tuberculosis	1
Had peritonitis, abruptio placentae, hypertension and cardiovascular renal disease	1
Had peritonitis	1
Had an antemortem section and died of hypertension and cardiovascular renal disease with hemiplegia	1
Total	7 (10.3%)

country, it is obvious that in general the transperitoneal operations are technically the simplest and therefore are to be chosen in preference to the slightly more difficult extraperitoneal types. Especially is this true when the time element is important with regard to the mother, as when she has severe hemorrhage, or to the baby, as

TABLE 5.—*Maternal Mortality from Low Cervical and Extraperitoneal Section*

Low Cervical Section — Deaths		Extraperitoneal Section — Deaths	
Cause	No.	Cause	No.
Peritonitis	2	Peritonitis (severance of ureter)	1
Pulmonary tuberculosis	1	Peritonitis, 53 H. L. with M. R.	1
		Hemorrhage	1
Total	3	Acute heart failure	1
		Total	4
Percentage in 637 cases, 0.471		Percentage in 209 cases, 1.913	

when prolapse of the cord occurs when rapid vaginal delivery is impossible and cesarean section is resorted to in effort to save the baby. Generally speaking, therefore, transperitoneal operations are to be chosen when the time of operation is elective as far as the duration of labor is concerned. This principle will generally apply in cases of disproportion sufficient to make the employment of cesarean section a predetermined matter; in cases of the hemorrhagic complications of labor, such as placenta previa and premature separation of the placenta; in cases of severe toxemia in which there has been no labor at all, and in similar situations.

Cesarean section has to be done, however, in many cases in which previous hope of successful vaginal delivery is disappointed in actual labor. In all such cases there is a greatly heightened risk of infection, on the basis of either neglect and injudicious handling or the mere duration of labor and the interval between the rupture of the membranes and the time of operation. The employment of any transperitoneal type of operation in these cases is inadmissibly dangerous, and the only safe recourse is to mutilating operations, such as the Porro operation, or to extraperitoneal section.

One may perhaps ask why in a well organized clinic there should ever be disappointment of the prognosis made prior to labor provided that prognosis was based on such care in prior examination as many physicians

TABLE 6.—*Fetal Mortality After Classic Section in Sixty-Eight Cases*

Condition of Mother	Number of Stillbirths
Abruptio placentae	10
Toxemia, unclassified	1
Hypertension and cardiovascular renal disease	1
Mother moribund with lobar pneumonia	1
Total	13 (19.12%)

believe to be within the competence of qualified obstetricians. We do not believe that absolute accuracy of prognosis is within the competence of any man. We believe this because in our own clinic a large number of patients are conscientiously and carefully subjected to all due scrutiny by a staff of alert, well trained, experienced obstetricians. Any one of us would readily concede that any number of obstetricians might possess higher competence than his own. We are not ready, however, to concede that many obstetricians possess higher practical competence than is represented by our combined resources. Our error approximates 20 per cent. In the 20 per cent of patients for whom our prognosis has been erroneous there are two groups. In the one to whom we have given a good prognosis not all are successfully delivered by the vagina. If we persisted in delivering all this group from below we would certainly lose babies which should survive. But it is not certain that some of them are undeliverable by the vagina until many hours of labor have passed. We cannot safely apply transperitoneal technics of cesarean section to them. Hence of necessity we have to resort to extraperitoneal section. The other group, for whom we may fear that vaginal delivery will not be reasonably possible, sometimes are delivered by the vagina. To subject all this group to elective section without some test of labor would certainly result in a large number of unnecessary operations. Therefore, in respect to fetopelvic disproportion, we seldom employ cesarean section without some trial of labor. In making this confession we have no apologies to offer but feel

TABLE 7.—*Fetal Mortality After Low Cervical and Extraperitoneal Section*

Low Cervical Section (637 Cases)

Stillbirths (28) — Cause	No.	Neonatal Deaths (25) — Cause	No.
Abruptio placentae	19	Erythroblastosis	3
Preeclampsia	2	Icterus gravis	1
Placenta previa	1	Hydrocephalus	1
Eclampsia	1		5
	23	All other causes	20
Unexplained	5		
	28	(Included are all babies of 1,500 Gm. or over)	25

Mortality of whole group, 53 of 637, 8.32%

Extraperitoneal Section (209 Cases)

Stillbirths (8) — Cause	No.	Neonatal Deaths (3) — Cause	No.
Unexplained	8	Intracranial hemorrhage	1
		Others	2
			3

Mortality of whole group, 11 of 209, 5.26%

that such a policy contributes definitely to the best interest of our patients.

We will briefly exhibit the results of the employment of the three types of section by us during the last eight years, an approximate incidence of 2.5 per cent. In connection with these brief statistics two considerations must be accepted:

1. They are presented on only a few bases, and no attempt is here made to adjust responsibility for deaths or to delete deaths from any cause whatever; moreover, gross statistics of morbidity do not exhibit relative desirability in relation to severity of morbidity.

2. There is no significant technical difference between the classic type of section, as defined in this paper and practiced by us, and the lower segment type, especially when a vertical incision is employed. (This is extremely important.)

In table 1 is exhibited a maternal morbidity of 44.1 per cent in 68 cases of classic section, in about nine tenths of which the operation was performed under absolutely elective conditions.

In table 2 is a more detailed exhibition of the morbidity from 637 low transverse sections, 510 of which included transverse incision of the uterus, 521 of which

were done under virtually elective conditions, i. e., without more than nine hours of labor with ruptured membranes. The average morbidity is slightly higher than that for classic section, but our distinct impression is that the severity of the morbidity is less.

In table 3 are shown similar morbidity statistics for extraperitoneal operations, about half of which were by the Latzko technic and the rest by the Waters technic. All the patients had been in labor with membranes ruptured for more than twenty-five hours, thus presenting a distinct difference as compared with the other patients, on whom operation was done early in labor. As is to be expected, the morbidity is definitely higher. It is significant, however, that in no case did the morbidity exceed ten days.

Table 4 shows the maternal mortality from classic section in 68 cases, amounting to 10.3 per cent. It is evident from this table that in all the fatal cases this type of operation was selected with reference to the condition of the mother, to shorten the time of operation, without reference to other considerations. Therefore the inordinately high mortality is not a valid index of the possibilities of classic section and will be excluded from further discussion.

Table 5 exhibits the maternal mortality from low cervical and extraperitoneal section. We believe that this table most significantly indicates the necessity for reserving all types of transperitoneal section for patients whose condition gives relatively favorable indications.

Table 6 shows the incidence of stillbirths after classic cesarean section: 19.12 per cent. The same observation applies to this incidence as was made with reference to maternal mortality from classic section, and no significance will be attached to it in our discussion or conclusions.

Table 7 gives the fetal mortality after low cervical and extraperitoneal cesarean section.

CONCLUSIONS

1. Modern indications for cesarean section are relatively broad but must be assessed by careful individualization of cases on the basis of sound obstetric judgment and careful consideration of conditions.

2. When conditions are relatively elective the transperitoneal approach is best, on the basis of greater rapidity and facility of technic.

3. Favorable elective conditions include complete lack of contamination, freedom from clinical evidence of infection, duration of total labor not in excess of twenty-four hours and duration of labor with ruptured membranes not in excess of eight to twelve hours.

4. When the transperitoneal approach is made under the foregoing conditions it is relatively immaterial whether the modern classic technic or a lower segment technic is employed. We believe, however, as a matter of mature observation, that the lower cervical technics result in smoother convalescence and in decidedly less danger of future rupture of the scar.

5. In cases in which the previously indicated conditions do not obtain, operation should be confined to the technics embracing extraperitoneal approach. The results of such technics, even in much-neglected patients, have been in our experience extremely good in relation to maternal mortality and morbidity and to fetal survival.

254 Union Street.

MORTALITY, EARLY AND LATE, FOLLOWING CESAREAN SECTION

FREDERICK H. FALLS, M.D.
CHICAGO

When in the course of pregnancy or labor it becomes necessary to consider delivery by cesarean section as the best way to minimize the danger which is present in an individual case, the various methods of delivery from below must be carefully compared in order to evaluate their dangers to mother and baby under the peculiar exigencies of the situation. A careful weighing of the possibilities for each method of delivery is mandatory in order to avoid unnecessary risk. This can be done effectively only by a physician thoroughly trained in obstetrics. It is possible for one with sufficient general surgical skill to operate on the mother, to obtain a live baby and to have the mother also survive. Practically, however, it is found that in many instances the operation might have been avoided if the strictest indications had been observed and operative intervention delayed until absolute necessity dictated it. Failure to observe these principles is reflected in increased maternal and fetal mortality.

A second important factor contributing to mortality among women who eventually are delivered by cesarean section is the pernicious, wishful thinking of obstetricians of the Micawber type, who are always waiting for something good to turn up in an obstetric case instead of making careful estimates of what the forces of nature have done and may do to bring about spontaneous delivery. Too often the medical attendant suffers from an acute subluxation of the wishbone until it displaces his backbone. Patients are often allowed to progress until they get into serious difficulty, and the dangers of cesarean section are enormously increased by failure to seize the golden opportunity to do the operation early under favorable circumstances in place of procrastinating until conditions for surgical success are at the vanishing point. It is especially irritating when timidity is permitted to masquerade as conservatism. The policy, then, should be to be wisely conservative until circumstances indicate that one's attitude is creating a more dangerous set of circumstances than existed before, at which time more radical treatment must be undertaken.

The mortality from cesarean section depends on a number of factors, which may operate singly or in combination to bring about the fatal result. The dangers which threaten the lives of the mother and the baby may be inherent in the operative procedure itself or depend on the conditions necessitating the operation or on certain complications arising during convalescence or later. In this discussion I shall quote few statistics, for although statistics are valuable from a historical standpoint they are usually dependent on a variation in material and technic so wide as to be of little practical value for comparison with results obtained in one's practice. On the other hand, the dangerous complications which result in mortality are the same universally, and their nature and avoidance will be the theme of this discussion, in which I shall consider both maternal and fetal mortality.

From the Department of Obstetrics and Gynecology, University of Illinois College of Medicine.

Read before the Section on Obstetrics and Gynecology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

Inherent in every cesarean section is the danger of hemorrhage not only at the time of incision into the uterus but immediately before and after operation. The severity of preoperative hemorrhage frequently may be gaged from the history of the patient or from the evidence presented by the visible loss of blood and from careful and repeated blood counts. In many cases the operation can with advantage be temporarily delayed until the acute anemia has been overcome in whole or in part by blood transfusion. If a continued hemorrhage indicates an immediate operation, concomitant blood transfusions can be given. All too often the preparations for transfusion are postponed until the serious condition of the patient forces the physician to recognize the necessity for transfusion. When this occurs panic and haste interfere greatly with speedy, efficient service and technic. Hence all pregnant women who bleed vaginally should have a complete blood examination, including erythrocyte, leukocyte and differential counts, together with estimation of the hemoglobin content, blood typing and cross matching with the blood of suitable donors as soon as possible after the appearance of the hemorrhage. Under circumstances in which blood transfusion cannot be arranged the intravenous use of pooled serum or acacia solutions is indicated; failing these, the injection of dextrose in 10 per cent solution in physiologic solution of sodium chloride is useful.

During operation a severe hemorrhage may unexpectedly occur immediately after delivery. This complication is especially to be feared if the placenta occupies a position in the anterior wall just under the uterine incision. This tendency is greatly reduced, in my experience, if as a prophylactic routine 1 cc. of solution of posterior pituitary is injected directly into the uterine muscle a few moments before it is incised. I have never seen serious shock follow such an injection, although the possibility has been pointed out by other investigators. After the birth of the baby the uterus should be stimulated by vigorous massage if it tends to relax, and it may be brought out onto the surface of the abdomen for this purpose if necessary. It is my custom to compress by Allis forceps the larger uterine sinuses found bleeding on the cut surface of the uterine incision, until sutures can be placed.

After the birth of the baby it is my custom to inject a dose of an active ergot preparation into a deltoid muscle to increase the uterine muscle tone. If slight bleeding persists the uterine cavity may be packed with gauze soaked in weak hot saponated solution of cresol and wrung out. One end of the pack is pushed through the cervix into the upper part of the vagina, from which it can be recovered in forty-eight hours. In rare cases in which the hemorrhage does not start until after the operation, when the patient has been returned to her room the cervix may be exposed with a speculum and steadied with a tenaculum, and a 10 yard (9 meter) strip of gauze which has been soaked in saponated solution of cresol and wrung out may be used to pack the uterine cavity. The vagina should also be packed tightly, as the packing may act by producing counter pressure against the uterine arteries or by reflexly stimulating uterine contractions. Because of the closed cervix this procedure is sometimes difficult or impossible to follow on primiparas who have not been in labor.

In cases of premature separation of the placenta in which the muscle fibers of the uterus have been dissociated by the blood (uteroplacental apoplexy of Couvelaire), packing and the use of solution of posterior pituitary and ergot preparations are usually unavailing. In such cases supracervical hysterectomy is indicated as soon as it is determined that the uterus is incapable of contracting sufficiently vigorously to stop the postpartum hemorrhage after the removal of the baby and the placenta by cesarean section.

The fatal outcome is due in most instances to the failure of the medical attendant to recognize the nature of the complication promptly and to follow the diagnosis by swift and decisive action. In the obstetric department of the University of Illinois College of Medicine, for the past eleven years in 10,977 cases not a patient has been lost from this complication. As soon as the diagnosis is even probable, if conditions are unfavorable for immediate delivery from below the abdomen is opened, the baby and the placenta are removed and the uterus under the full stimulation of oxytocics is observed. If it responds by good firm contractions it is sewn up; if not, supracervical hysterectomy is done. There have been 144 patients whose condition was diagnosed premature detachment of the placenta, and 26 of these have been treated by cesarean section.

Repeated blood transfusions may be necessary in some cases, and therefore it is advisable to have more than one donor available. The well organized blood bank is a long step forward in preventing mortality.

Shock is not infrequently a cause of death after cesarean section. This may be due to loss of blood, prolonged and rough operating technic, nervous instability in the patient, especially if she is under 18, or exhaustion from pain and long labor. The onset of shock can usually be foretold if a close watch is kept on the blood pressure, and if appropriate measures are taken to combat it the danger can be minimized. Prophylactically, it is important to see to it that women in labor who may need a cesarean section have rest and sleep and that they do not become dehydrated. It is often a valuable procedure to postpone an indicated cesarean section for some hours if there is no emergency, until the patient can be built up by sleep, intravenous injections of dextrose and stimulants to help her withstand the operative shock. During operation careful handling of tissues, rapid smooth technic and limiting the loss of blood combine to minimize danger from shock. Postoperatively the patient should have blood replaced if the loss has been excessive and should be given oxygen and stimulants for weak cardiac action, such as digalen, dextrose given intravenously, epinephrine or nikethamide in full doses. Caffeine with sodium benzoate has also proved useful for some patients after recovery from the immediate symptoms of shock. Close cooperation between the anesthetist and the surgeon should minimize the danger of shock. The anesthetist is in a strategic position to observe the earliest signs of shock and to acquaint the surgeon with the fact of its presence and is able to lessen the degree of shock by lightening the anesthesia as soon as it is safe to do so.

Occasionally massive collapse of the lung may result fatally during or after cesarean section. This complication can be treated by the aspiration of mucus from the bronchial tree through the bronchoscope. Forced breathing of a 30:70 mixture of carbon dioxide and oxygen by means of a pressure bag attached to an

anesthetizing machine is also of value. Forcing a few whiffs of the mixture into the lungs under pressure will frequently result in a violent cough, the expulsion of the mucous plug and reopening of the collapsed portion of the lung. The oxygen tent as a temporary

Fig. 1.—Uterus arcuatus. Postmature child. Transverse presentation and prolapsed cord with thin uterine wall.

expedient in the acute stage is valuable. Full cardiac stimulation is indicated.

Acute dilatation of the stomach is relatively frequent and may be a fatal postoperative complication of cesarean section. It is frequently associated with and part of paralytic ileus. It should be easily detected and can be treated by decompression of the stomach by the Wangensteen suction apparatus. The administration of stimulants in full doses is indicated. Prophylactically, the less the bowels are handled and the more rapidly and smoothly the operation is carried out the less tendency there will be for this complication to arise.

Since heart disease is recognized as an indication for cesarean section in some cases, cardiac failure may precede or follow operation. I believe that the danger of the operation hinges particularly on the degree of compensation manifest in a given case and how this may be influenced by medical management. If the condition is such that a few days rest in bed with proper elimination and cardiac stimulation results in restoring compensation, the patient will be a much better operative risk. When feasible, local anesthesia reduces the pulmonary irritation which may predispose to the development of pulmonary edema and pneumonia. The further the pregnancy can be carried the better the prognosis for the baby, up to the thirty-fourth week. A compromise may be necessary and operation performed between the twenty-eighth and thirty-fourth week if decompensation threatens the mother's life. When decompensation cannot be controlled before the infant is viable, I prefer emptying the uterus by vaginal cesarean section.

When pulmonary edema develops in a pregnant woman from any cause the first effort should be to remove the cause and reduce the edema. To this end fluids are restricted and rest in bed, administration of digalen and magnesium sulfate by mouth and inhalation of oxygen may be useful. In most cases operation may be deferred until after improvement in the pulmonary condition. The use of the Drinker apparatus in certain cases is of value before and after operation. If beginning pulmonary edema manifests itself early in the first stage of labor in a primipara it is usually better to operate at once and treat the edema postoperatively. The decompression of the uterus permits of much better ventilation of the bases of the lungs and improves the circulation by relieving pressure. If, on the other hand, the edema first appears during labor in a multipara, the dilatation of the cervix can usually be hastened by the use of manipulation, or Dührssen incisions may be employed with advantage to complete it. However, if even a moderate pelvic contraction is present it may be safer to do a cesarean section with the aid of local anesthesia.

Hypertension without convulsions increases the danger of pregnancy and labor by predisposing to serious toxic symptoms which may lead to a fatal outcome. Cerebral hemorrhage occurs in some cases, and anuria and uremia may be present and difficult to control. When the indication for cesarean section is not of an emergency character the patient should be put to bed and treated for the hypertension for at least a week before one resorts to surgical intervention. The operation is best done with local anesthesia without the use of epinephrine. In the majority of cases if the hypertension is associated with chronic nephritis the interests of the patient are best subserved by the performance of sterilization at the time of operation. On the other hand, if the hypertension is rapidly advancing and of the eclamptogenic toxemia type and convulsions are imminent cesarean section, best done with local anesthesia, is imperative. When convulsions are present the seizures may cause extrusion of some of the abdominal viscera through the wound and may interfere seriously with proper suture of the uterine and abdominal wounds, thus increasing the operative time, the danger of infection and the loss of blood. I feel that under these circumstances cesarean section with ethylene anesthesia is indicated. The technic should be especially guarded with regard to asepsis, since the patients stand

Fig. 2.—Placenta previa centralis. Absolute indication if fetus is viable. Danger of fetal death if labor starts is obvious.

infection poorly. Loss of blood up to 500 cc. should be encouraged if the patient is not anemic, since bleeding has long been known to be of value in such cases. One of the most important points in the postoperative management is to keep the patient to a strict dietary

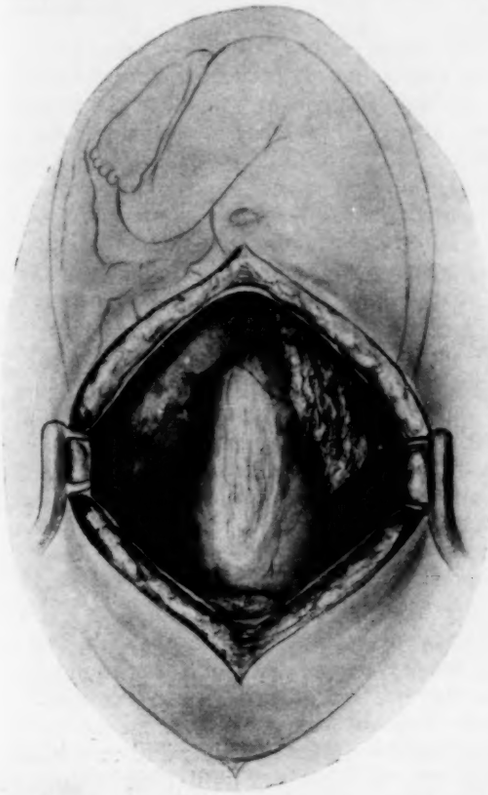

Fig. 3.—Previous cesarean section. Rupture may occur before or after onset of labor. Thinning and stretching of uterine scar and adhesions of bowel and omentum create special operative hazards.

regimen until the blood pressure has become reduced and the casts and albumin in the urine begin to disappear.

I wish it clearly understood that I do not advocate cesarean section for patients with eclamptogenic toxemia except those in whom the toxemia cannot be controlled by medical management, especially if they are primiparas, or in whom the symptoms develop in a fulminating manner which does not permit a trial of medical management. In a series of 1,000 cases of eclamptogenic toxemia, 37 mothers have been delivered by cesarean section with no deaths; of these, 12 had eclamptogenic toxemia of the convulsive type. Again I would stress the importance of decisive action. Procrastination and indecision are the cause of the mortality in such cases, not cesarean section. Naturally it does not take long for the rapidly shifting clinical picture to develop to a stage at which the cerebral edema, hepatitis, nephritis and myocarditis make operative intervention virtually the same as manslaughter.

Sometimes a patient with an acute infection outside the generative tract must have a cesarean section to save her life, the life of the baby or both. Fortunately such patients are extremely rare, but one does well to remember that they do exist and must be cared for. If the infection is not too near the midline of the abdomen the dangers of directly contaminating the peritoneal cavity are not great. The prophylactic removal of the uterus by Porro section is recommended, because it automatically removes the danger of puerperal sepsis and so leaves one with but one danger (peritonitis) to combat instead of two. The prophylactic use of immune serum and of sulfanilamide derivatives (about 60 to 80 grains [4 to 5 Gm.] a day) is desirable and should be started immediately after operation.

Occasionally the bladder or the bowel is injured during cesarean section. The accident is not so serious as a rule if the hole is found and carefully repaired. The patient is given a urinary antiseptic, and an indwelling catheter is kept in the bladder for twelve days. Injury to the bladder is most likely to follow the low cervical and Porro operations. When injury is suspected but not proved, a catheter should be passed and the bladder distended with boric acid solution containing methylene blue to reveal the location of the hole. Peritonitis from an unrecognized injury of the bowel or extravasation of urine from an overlooked injury of the bladder may be fatal.

Ruptured membranes increase the danger of cesarean section because of the increased likelihood of bacterial contamination of the uterine cavity. The mother is jeopardized primarily because of the possibility of infected uterine spill contaminating the peritoneal cavity and starting general peritonitis and secondarily because puerperal sepsis may develop in the uterus and spread to other parts of the body. Again the time element is all important. Operation within a few hours after rupture entails practically no additional risk. After the fourth hour, however, the danger rapidly increases. As a corollary, therefore, one may say that given a patient who may have to be delivered by cesarean section one may view with complacency the early stage of labor as long as the membranes remain intact. However, with their rupture the situation should be carefully

Fig. 4.—Placenta on anterior wall. Dangers: increased loss of maternal blood owing to vascularity at site of incision. Fetal hemorrhage from incision of placental vessels.

and critically studied and the decision to deliver by cesarean section elected or rejected and the treatment followed through on the lines given here. Neglect of this precaution will lead frequently to fatal complications even though ultimately a Porro cesarean section is done to minimize the danger from infection. At best

this is a makeshift procedure designed to salvage something from a serious situation produced too often by neglect or by ultraconservatism. In the presence of frank infection one should seriously consider a craniotomy, even though the heart tones may be thought to be present, if the fetus seems to be in bad condition and a high forceps operation fails after moderate traction.

I believe cesarean section is practically always indicated for central placenta previa and for the other types as well when the antepartum hemorrhage is profuse and the mother is in danger therefrom. In cases of partial separation in which there is only moderate hemorrhage and the fetus is just viable the decision to do a cesarean section or to deliver from below is a difficult one. If the patient is in labor she may be permitted to go on under close observation and a cesarean section performed if the heart tones become rapid or weak. If she is not in labor I give progesterone to inhibit uterine contractions and try to keep labor and hemorrhage from recurring until the baby is fully viable, at thirty-two to thirty-four weeks. Such management is justifiable only for hospitalized patients.

Pulmonary embolism is a rather infrequent complication after cesarean section. I feel that it is practically always associated with infection and that all patients who show evidence of thrombophlebitis of the broad ligament or the femoral veins should be kept at absolute bed rest for twenty-one days or until one can be reasonably sure that the clots in the femoral and iliac vessels have had time to organize sufficiently so that they will not be dislodged.

FETAL DANGERS

Various complications of labor as far as the fetus is concerned may indicate cesarean section. When prolapse of the cord occurs in a primipara with a cervix only a few centimeters dilated delivery by cesarean section is much safer. The danger lies in the fetal asphyxia which is apt to be present before the patient is operated on.

Nephritic toxemia in the mother not infrequently results in premature intrauterine fetal death. This regrettable accident is entirely unpredictable according to my experience. Abdominal hysterotomy should be done as soon as it is felt that the baby has a good chance of surviving after birth (at about the thirty-fourth week).

Habitual death of the fetus is a condition which requires the nicest judgment to determine when to invade the uterus and deliver a live baby. No premonitory signs or symptoms are present. One has to rely on the history to tell when one may expect the death of the fetus and act before this accident occurs.

Another danger to the fetus results from cutting of the large vessels of the placenta or the cord when the incision in the uterus overlies the site of placental attachment. Serious hemorrhage into the amniotic cavity from the fetal circulation may occur unless the baby is rapidly extracted and the cord compressed.

Acute placentitis often results in fetal septicemia, which frequently is fatal to the baby even if it is extracted by cesarean section. This complication most frequently follows premature rupture of the membranes.

Death of the mother as the result of either accident or disease should always be an indication for cesarean section if a viable fetus is present. When it is obvious that the mother is dying it may give the fetus a better chance if one performs the operation before the death of the mother than if one waits until she dies. Permission should always be obtained for this operation, but I have twice performed it without the permission of the family in an emergency, after hurried consultation with other physicians present, and have saved the infant each time.

Several hours after delivery babies extracted by cesarean section not infrequently have cyanotic spells which gradually deepen and finally end in death. The cause is obscure. Potter has found an unusual amount of cerebrospinal fluid and has expressed the belief that this may produce pressure on the respiratory center. Oxygen inhalations and stimulants are indicated but are not very effective in combating the condition.

Occasionally a cesarean section is undertaken, usually by a general surgeon in consultation with a general practitioner, even when labor has progressed to the stage at which the fetal head is deeply engaged. Under these circumstances serious injury may be done to the baby from forcible efforts at extraction of the head from the pelvis after the uterus is open. I know of 2 cases in which the baby was decapitated, and in both the mother died from hemorrhage before leaving the operating room. It is well, therefore, to be sure the head is not deeply engaged or can be disengaged before one attempts cesarean section.

Rupture of the scar from a previous cesarean section is practically synonymous with fetal death, and there is no practical way to prevent it except through anticipating the rupture by doing a second cesarean section before the rupture occurs. Unfortunately the accident can occur before the woman has had any labor pains. It rarely occurs, however, until after viability of the baby is established. Therefore if there is a history of febrile convalescence from the first operation one may assume a weakness of the scar and do a cesarean operation prophylactically after the fetus becomes fully viable.

The maternal mortality from this form of rupture of the uterus is low compared with that of rupture during labor. Because of the cicatricial nature of the edges of the rupture hemorrhage is not a serious complication as a rule.

A study of the records of the pathologic department of Cook County Hospital shows the outstanding cause of maternal mortality in cases in which cesarean section is done to be ruptured uterus.

CONCLUSIONS

It will be seen that the mortality from cesarean section both early and late for the mother and the baby is dependent not so much on the operation as on the indication for which the operation is undertaken and on the proper time of the operation in relation to the onset and course of the complication. In certain instances quick, decisive action is imperative, even in the presence of serious complications which under ordinary conditions would contraindicate major surgical procedures. In other circumstances conservatism until the patient can be placed in the best possible shape for major surgical intervention is indicated.

Careful evaluation of the factors involved in all complicated obstetric cases should be made, if possible, prior to the onset of labor and a plan of action outlined which will be thoroughly understood by the patient as well as

by the attending physician and his associates. Only in this way can one avoid the dangerous situations which arise because of unwarranted procrastination and are responsible for the greater percentage of deaths both maternal and fetal which are charged to cesarean section at the present time.

30 North Michigan Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. COSGROVE AND NORTON AND DR. FALLS

DR. LOUIS E. PHANEUF, Boston: Drs. Cosgrove and Norton have emphasized the most important factor in cesarean section, namely individualization of the patient. While the classic operation may be a satisfactory method for the clean patient, it cannot be employed with the same safety in the contaminated gestant. The several procedures described were devised in the course of years as experience increased. I myself use the low flap operation in all clean cases; the peritoneal exclusion technic, of which there are two varieties—the Veit-Fromme-Hirst, with a longitudinal incision in the uterus, and the recently devised Erwin F. Smith technic with a transverse incision in the lower segment, for the presumably infected woman. The extraperitoneal procedure, either the Latzko or the Waters operation, is used for the frankly infected patient, and finally the temporary exteriorization of the uterus, the Gottschalk-Portes operation, or the Porro operation in the badly neglected parturient. Whether one makes a transverse or a longitudinal incision in the lower segment is a matter of individual preference. I favor the transverse incision. By following the recommendations presented in the paper, that is, proper selection of operation, maternal mortality in cesarean section could be reduced to its minimum figure. Dr. Falls has covered the causes of early and late mortality in cesarean section. The three outstanding causes of mortality have been, from the earliest times of the operation, hemorrhage, sepsis and pulmonary complications. Hemorrhage has been controlled to a great extent by prophylaxis on the one hand and by blood transfusions on the other. The replacement of blood has become a very simple procedure. The blood is usually administered without even moving the patient from her bed. If we go back a little more than two decades we find that then the blood transfusion was more of an operation than the cesarean section itself, showing the marked improvement in the replacement of blood. Improvements from infection have come through two avenues: (1) from the better understanding of obstetrics, resulting in operating early in labor, before contamination has occurred, and (2) by choosing the proper method for a given case, as exemplified in the first paper. There is hope that the sulfonamides may still further aid in reducing the infections of childbirth. Pulmonary complications can be reduced by the more general use of local infiltration anesthesia in the performance of abdominal delivery. While the technic is more meticulous and slightly more time consuming, both patient and obstetrician are rewarded by the smoother convalescence and the reduced complications.

DR. H. HUDNALL WARE JR., Richmond, Va.: My associates and I use the low classic operation in the elective cases when the patient is not in labor, and our results in this group have been good. If one decides to deliver a patient by abdominal operation under other circumstances, a careful estimation of a number of factors must be made before the type of procedure is selected. The type of operation should depend on the patient's general physical condition, age, the number of children and the amount of manipulation, with attendant trauma and possibly infection to which the patient has been subjected during labor. The low cervical or double flap operation is preferred in cases in which the membranes have ruptured, active labor has started or unquestioned sterile vaginal examination has been made. In probably or obviously infected patients and in all patients in whom unsuccessful delivery has been attempted from below, either the extraperitoneal or a modified Porro operation should be performed if abdominal delivery seems necessary. At the Medical College of Virginia Hospitals during the past five years, 30 patients have been delivered either by the modified Porro operation or by cesarean section followed by hysterectomy. There was only one death in this group, and autopsy showed that this patient had a severe pyelonephritis. The newer types of cesarean operations have reduced the mortality rate for operative cases, but the modified Porro operation still has a definite place for a small group of neglected obstetric patients.

DR. JOSEPH B. DE LEE, Chicago: The frequency of cesarean section in this country is out of all proportion to the necessities and contributes largely to our continuing high maternal mortality, although, in general the country over, the mortality is being reduced. The cesarean operation has partaken of that improvement which all surgical procedures have enjoyed, and that is one of the reasons doctors resort to it so often. I was hoping that I would live to see the day when craniotomy on the living child would be obsolete, but that is not yet true. Cases in which craniotomy on the living child are indicated are very few in number compared with the olden time. The essence of Drs. Cosgrove and Norton's paper was the difference between the intraperitoneal and the extraperitoneal approach to the lower uterine segment in cases of infected labors. In 1920 to 1929 we had much discussion about the values of these two operations, the Latzko extraperitoneal and its modifications, and the direct transperitoneal or intraperitoneal approach that Veit, Froome, Sellheim, Beck and others have perfected. At that time we found that the difference in mortalities was not significant, that the peritoneum would take care of a lot of infection and that the connective tissue was not any more resistant to infection than the undamaged but closed peritoneal cavity. However, perhaps there might be a little greater advantage in the extraperitoneal approach. Local anesthesia was mentioned by Dr. Falls. I think that local anesthesia should be the method of choice in all cases, and of cesarean section particularly. The shock which Dr. Falls mentioned I have found present only in women who are likely to have shock from other causes than the operation—heart disease, pulmonary affairs and toxemias. In a woman who hasn't these conditions, shock is very rare under local anesthesia. At the Lying-in Hospital in Chicago we have had about 1,500 cases under local anesthesia. We have yet to see a massive collapse of the lung. In fact, we have had no deaths from anesthesia in over 1,500 cases of local anesthesia in cesarean section. I feel, in spite of the wonderful results shown by Drs. Cosgrove and Norton, that spinal anesthesia has inherent dangers which make it unwise when one can do the same operation just as well with local anesthesia. Of the difference between the old classic and low cervical cesarean section, I feel that the old classic cesarean section should, with almost no exception, be called obsolete. If, however, one feels that one must do an old classic cesarean section, I would recommend the low operation modified by Dr. Schumann of Philadelphia, in which he makes a flap, a sort of little trap door, in the lower part of the uterus and then, pushing the cover of the door aside, makes the incision.

DR. JAMES F. NORTON, Jersey City, N. J.: We have nothing much to offer in closing. I agree with Dr. De Lee that there is a lot to say about cesarean section. We presented just one phase, the management of women long in labor, with membranes ruptured, with the presenting part fixed at the inlet, not engaged, who have had sometimes many vaginal examinations, many rectal examinations, and on whom occasionally an unsuccessful attempt has been made to deliver through the birth canal. We are confronted with that problem all too frequently, and to circumvent the disastrous consequences of transperitoneal section we have utilized, in quite a number of cases, an extraperitoneal approach to the lower uterine segment. We offer for comparison a morbidity study of the low cervical, the classic and the extraperitoneal group, and we feel that we have something that serves us well in a very difficult situation. Since our clinic was opened we have had about 50,000 women. We have not done one craniotomy on a living child; it is passé as far as we are concerned. Of the four deaths in the extraperitoneal group of cesarean section, in a study of 209 patients 1 was in labor for fifty-four hours with ruptured membranes had an intrapartum rise in temperature to 103.4 F. before she was operated on and under any obstetric management at all

would have been a very formidable problem. One death, I think, is related to the operation, severance of a ureter and general sepsis, but at postmortem examination I think the strongest argument we have for utilizing the true extraperitoneal type of incision came from this case of severance of a ureter in an individual who had previously a pyelitis, that is, an intrapartum pyelitis. The peritoneal cavity was not infected. The patient died of general sepsis but did not have a proved peritonitis at postmortem examination. We had one death from hemorrhage, and hemorrhage is inherent in all cesarean section problems. We had one death which has been called acute heart failure for want of ability to define it more accurately; it might well have been any number of things. We were not able definitely to assess truly the cause of the death. That death and the hemorrhage death and the death of the woman long in labor may have occurred from any type of operation, which really leaves us with one death truly assessable against an extraperitoneal infection, and that in an individual who at postmortem examination did not have a peritoneal infection.

DR. FREDERICK H. FALLS, Chicago: I did not discuss the cause of fetal mortality in the paper. The prolapse of the cord in an undilated cervix is the important reason for cesarean section from the standpoint of the fetus. In partial premature detachment of the placenta, if the hemorrhage is only minor and stops, it is best to allow the woman to go on and take the chances of delivery from below, but, with a continual trickle of blood and not knowing what is going to happen to the placenta, I feel that cesarean section is the best way out of the difficulty. As soon as the membranes rupture, a new element enters the obstetric case and the case should be reevaluated. The question of a moderately contracted pelvis, and of toxemia, coupled with early rupture of the membranes should mean that the case is reevaluated in the light of the new accident, which may be the determining factor in delivering the patient by cesarean section instead of from below. Another factor which occurs in causing mortality is pulmonary embolism, which in my opinion is always due to infection. The infection many times is low grade, and it is a thrombophlebitis of the veins of the pelvis and is often overlooked. So, given a woman having a low grade temperature, with a moderate tenderness in the region above Poupart's ligament, I watch the patient very carefully until satisfied that there is no thrombophlebitis of the veins. There is some question as to whether continuous or interrupted suture is the best method of repair after the low cervical operation. I have used the continuous suture many years. In closing, it is a pretty thin piece of uterine muscle and in the presence of hemorrhage there is a tendency for the operator to pull the suture tight to stop the hemorrhage. The hemorrhage is not occurring from that wall; it is bleeding from inside the uterus, and it doesn't make any difference how tight you pull these sutures, it won't stop the hemorrhage, and if you pull them tight there is the possibility of a slough in that uterine wound.

The Human Factor in Aviation.—Man has manufactured a machine to which he is inferior so far as operating efficiency is concerned. To a certain extent, rules set up to givern his action overcome the difficulty. . . . But rules cannot be devised which will insure proper action in every emergency. Ultimately such action will depend on the good judgment of particular men, and what the aviation industry is trying to do is make sure that its pilots are the sort of men who will exercise good judgment. It is trying to devise physiological and psychological methods by which it will be able (1) to select the proper persons as pilots, (2) to maintain them at their maximum efficiency and (3) to eliminate those who fall below an established level. Pilots must be absolutely normal men, physically, mentally and spiritually. The industry is trying to find standards for choosing such men and determining whether they remain so. So far it has been successful only in certain respects. Here is the problem of research in the human factor in aviation. —Fatigue of Workers, Report of Committee on Work in Industry of the National Research Council, New York, Reinhold Publishing Company, 1941.

THE MILLER-ABBOTT TUBE IN SURGERY

OCTA C. LEIGH JR., M.D.
AND
RICHARD O. DIEFENDORF, M.D.
NEW YORK

Since the introduction of the Miller-Abbott [1] principle of intubation of the small bowel for the management of ileus by Abbott and Johnston,[2] the morbidity and mortality in our series of cases of this disease has been reduced to an all time low figure.[3] Although often eliminating some surgical procedures, the technic should not be considered as a nonoperative method of treatment but rather as an adjunct to proper surgical care.

We continue to advise immediate operation in cases of strangulated hernia or other obvious early mechanical obstructions with mild distention and, of course, all cases suspected of gangrene of the bowel. Continuous gastric or duodenal suction and other simpler therapeutic measures are still used in many cases of mild involvement in which there is moderate distention, particularly in the early postoperative period. In the cases reported here either mechanical obstructions were demonstrated at operation or distended loops of small bowel with fluid level formation appeared when viewed radiographically.

OBSTRUCTIONS OF THE SMALL BOWEL

The immediate therapeutic problem in noninflammatory obstructions of the small bowel, either paralytic or mechanical, is the restoration of fluid balance and body nutrition while distention is controlled and an accurate diagnosis is made. We have classified as "paralytic obstructions" all cases in which a mechanical obstruction was not demonstrated by intubation of the small bowel. It is recognized that sufficient motor activity is present after deflation to pass the Miller-Abbott tube along the entire length of the small bowel. The term is retained, however, since it is generally accepted by the profession and it is our impression that active peristalsis is either absent or greatly depressed before deflation is accomplished.

Our cases in the paralytic group were associated with lesions of the spinal cord due to trauma or infection, retroperitoneal hemorrhage or infection, pneumonia, renal stones and surgical trauma of the abdominal viscera and included a few cases that appeared to be either augmented by or caused by edema of the bowel.

The group of cases thought to be due to edema of the bowel was of considerable interest, since this factor is not generally recognized. Two occurred in the early postoperative period in patients having a low plasma

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From the Department of Surgery of the Presbyterian Hospital and Columbia University College of Physicians and Surgeons.

Read before the Section on Surgery, General and Abdominal, at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Miller, T. G., and Abbott, W. O.: Intestinal Intubation: A Practical Technic, Am. J. M. Sc. **187:** 595-599 (May) 1934.

2. Abbott, W. O., and Johnston, C. G.: A Nonsurgical Method of Treating, Localizing and Diagnosing the Nature of Obstructing Lesions, Surg., Gynec. & Obst. **66:** 691-697 (April) 1938. Abbott, W. O.: The Treatment of Intestinal Obstruction and a Procedure for Identifying the Lesion, Arch. Int. Med. **63:** 453-468 (March) 1939. Johnston, C. G.; Penberthy, G. C.; Noer, R. J., and Kenning, J. C.: Decompression of the Small Intestine in the Treatment of Intestinal Obstruction, J. A. M. A. **111:** 1365-1368 (Oct. 8) 1939.

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protein who had been given large quantities of intravenous physiologic solution of sodium chloride. In 1 case 8 liters and in a second case 11 liters of fluid was aspirated through the Miller-Abbott tube from the upper part of the gastrointestinal tract during the first twenty-four and thirty-six hours respectively. The depressed motor activity of the intestine was evident by the extremely slow progress of the tube through the bowel.

Recently a man aged 51 was admitted to the hospital for extensive second and third degree burns of the right side of the body. On the fourth hospital day there was severe abdominal distention (fig. 1), nausea, vomiting and generalized edema. His total body weight had increased 6 pounds (2,722 Gm.) and the plasma proteins had decreased from 7.11 to 5.50 Gm. per hundred cubic centimeters. Proctoscopic examination revealed pale, edematous mucous membrane of the rectum and lower part of the sigmoid flexure having the general appearance of mucosa after the submucosal injection of saline solution. The Miller-Abbott tube was passed into the upper part of the jejunum but advanced slowly, owing to the depressed motor activity of the bowel. Spontaneous diuresis occurred two days later after the administration of 1,000 cc. of plasma intravenously and the continuous removal of fluids from the upper part of the small bowel. The tube, which had advanced only 2 feet (61 cm.) during the first two days of intubation, passed rapidly into the transverse colon as the edema and ileus disappeared.

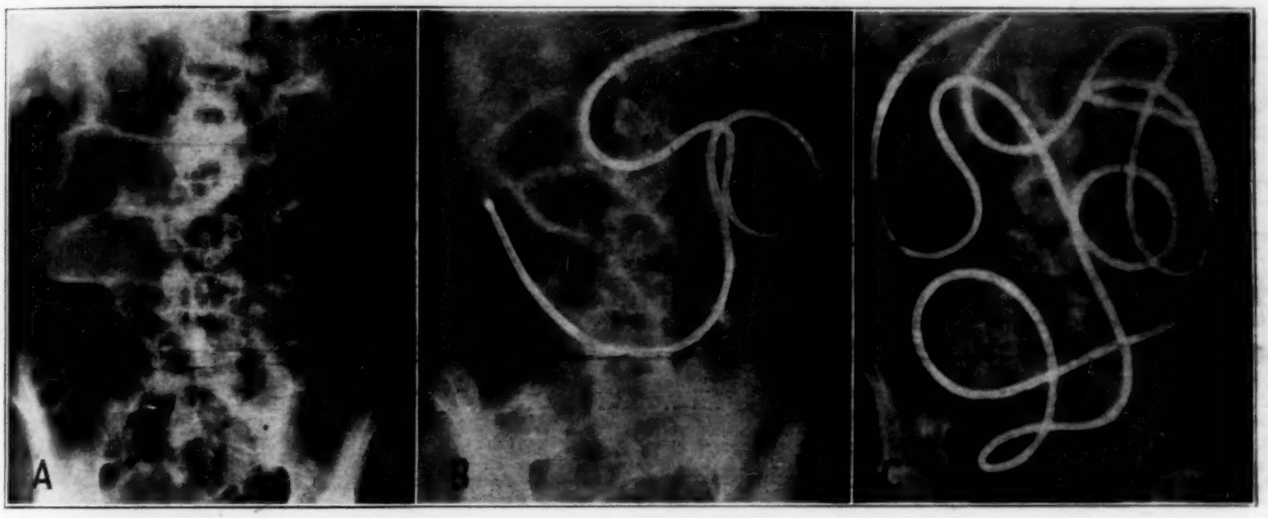


Fig. 1.—Acute ileus due to edema of the bowel: *A*, appearance of abdomen showing distended small bowel in a patient with extensive second and third degree burns and hypoproteinemia. *B*, showing the failure of the tube to advance because of poor peristaltic activity of the bowel. *C*, the rapid advance following diuresis.

TABLE 1.—*Summary of Noninflammatory Obstructions of the Small Bowel Treated with the Miller-Abbott Tube and Surgery*

Type of Obstruction	No. of Cases	Operations for Ileus	Died	Per Cent Mortality
Paralytic type	77	5	5	6.5
Mechanical type	132	103	6	4.6
Total	209	108	11	5.3

Heretofore, the administration of barium sulfate by mouth in cases of ileus has been of little value to the radiologist. The opaque medium was so diluted by the fluid accumulated in the distended proximal loops of intestine that it was practically useless. Now, after deflation, small amounts of barium suspension can be injected through the tube to identify the exact location and often the nature of the obstruction. Small inflammatory adhesions or knuckles of bowel which prolapsed into small defects in the peritoneum in the early postoperative period have been demonstrated in many patients thought to be suffering from paralytic ileus. The tube has been particularly helpful in guiding the surgeon to the offending lesion in cases of widespread postoperative or postinfectional adhesions. In long-standing cases with considerable inanition, secondary to a partial or recurrent obstruction, the tube may act as an ileostomy over a prolonged period while the patient is adequately prepared for operation by oral feedings. If the resection of a pathologic loop is necessary, the preliminary deflation is extremely helpful. The distended proximal loops are reduced to almost normal size before resection is attempted and the anastomosis protected postoperatively by maintained decompression.

TABLE 2.—*Summary of Obstructions with All Varieties of Peritonitis Treated with the Miller-Abbott Tube and Surgery*

Result of Intubation	No. of Cases	Operations for Ileus	Died	Per Cent Mortality
Tube passed into small bowel	70	20	11	15.7
Tube failed to pass into small bowel	24	4	9	37.5
Total	94	24	20	21.3

Two hundred and nine cases of noninflammatory obstructions have been subjected to intubation, with 11 deaths, or a mortality of 5.3 per cent. Two of the deaths listed as "paralytic obstructions" occurred in cases of terminal renal failure and death resulted from uremia after partial deflation had been accomplished. Five of the deaths in the mechanical group occurred in cases of generalized carcinomatosis in which death occurred after the obstructions had been relieved. The mortality for ileus alone in this group was 4 deaths in 202 cases, or approximately 2 per cent.

OBSTRUCTIONS WITH ALL VARIETIES OF PERITONITIS

It is our impression that obstructions secondary to an inflammatory process in the peritoneal cavity may be either paralytic or mechanical or both. We con-

sider this group of cases separately, since the therapeutic problem is immediately changed by the presence of the infectious process. The dramatic improvement that follows successful intubation seems to indicate that deflation improves the circulation of the bowel and prevents spread of the infection. A comparison of the mortality in the cases in which intubation was accomplished successfully (table 2) with the cases in which the tube failed to pass the pylorus shows the advantage of prompt deflation.

Most of our failures occurred in this group of seriously ill patients. We used to hesitate to subject these patients to the added discomfort of repeated fluoroscopic examinations but we now feel that the results more than justify the procedure.

Localized abscesses or early peritonitis often involves and obstructs the small bowel either by inflammatory edema per se or by causing angulations that result in mechanical obstructions (fig. 2). Prompt deflation allows adequate food and fluids by mouth until the infection subsides and the temporary obstruction is relieved. If the distention is allowed to persist, the distended loops are fixed in abnormal positions by fibrous adhesions that often lead to permanent obstructions (fig. 3).

TABLE 3.—*Radical Resections of Colon and Rectum for Carcinoma 1938-1940 Inclusive*

	Without Maintained Decompression			Decompression Maintained Before and After Operation			Total		
Type	No.	Died	Per Cent Mortality	No.	Died	Per Cent Mortality	No.	Died	Per Cent Mortality
Right colon	10	3	30.0	17	0	0	27	3	11.1
Left colon	57	11	19.3	22	3	13.7	79	14	17.7
Rectum	37	7	18.9	31	1	3.3	68	8	11.8
Total	104	21	20.2	70	4	5.7	174	25	14.4

PROPHYLACTIC USES OF THE MILLER-ABBOTT TUBE

Intubation of the small bowel is equally important to the surgeon in the prevention of distention in a selected group of cases in which the disease or operation may cause prolonged impairment of gastrointestinal activity. Distention occurring within the lumen of the bowel interferes with the circulation and leads to edema, poor motor activity and decreased absorptive function of the bowel. When pressure is applied along the suture line of a fresh anastomosis it may lead to tissue ischemia, necrosis, leakage of intestinal contents and the formation of fistulas or peritonitis.

TABLE 4.—*Obstructions of Small Bowel with Gangrene*

	No. of Patients	Died	Per Cent Mortality
Before Miller-Abbott tube, 1936-1937	13	9	69.2
After Miller-Abbott tube, 1938-1940	20	11	55.0

In our experience, patients requiring resection of the colon or rectum and those with serious infections of the peritoneal cavity are most likely to have these complications develop. If intubation is delayed until extreme distention has developed, the passage of the tube into the small bowel is always difficult and sometimes impossible. On the other hand, intubation is relatively simple if done before operation or early in patients with peritonitis before distention has occurred. We therefore advise prophylactic intubation in these patients.

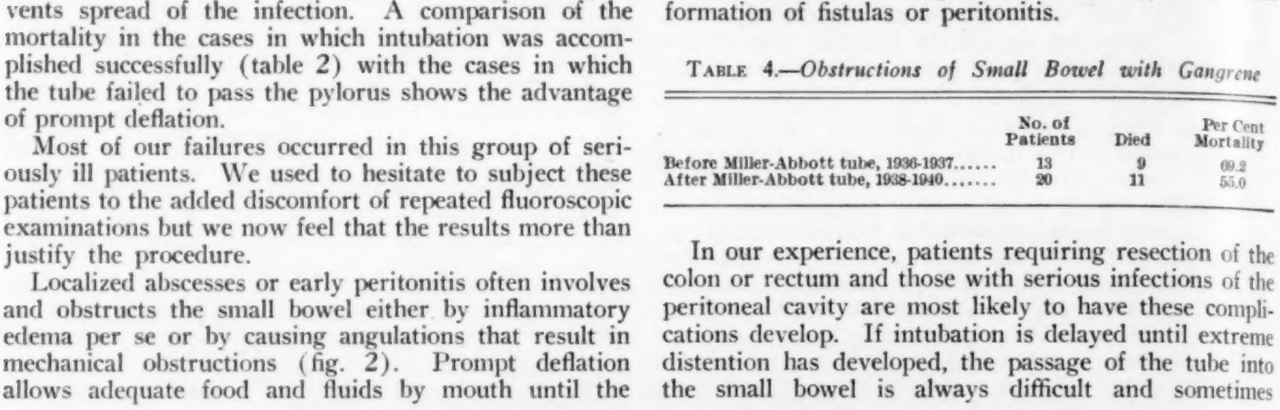


Fig. 2.—Acute diverticulitis with localized peritonitis and acute ileus: *A*, plain roentgenogram of abdomen with colon filled with barium sulfate showing distended loops of small bowel. *B*, after deflation the tube arrested in the region of localized peritonitis. Barium injected showed a partial obstruction thought to be due to angulation of the bowel involved in the inflammatory process. *C*, the tube at the cecum five days later. The obstruction disappeared as the infection subsided.

Our results in a small but well controlled group of consecutive cases of radical resections of the colon and rectum for carcinoma seems to indicate that preoperative intubation with maintained decompression in the early postoperative period has reduced the mortality by avoiding some of the serious complications often encountered in these cases.

The use of chemotherapy, improved anesthesia, controlled fluid therapy and the vitamins has improved the results in all our cases during the past few years. The improvement is most striking, however, in the cases in which the tube was passed before operation and decompression was maintained until normal bowel function was reestablished.

Our attending surgeons agree that prophylactic decompression is ideal in the one stage operations of the ascending colon. The arguments in favor of the two stage operation of the ascending colon were based on the dangers of leakage from the ileocolostomy done at the time of resection. With the maintenance of

deflation before and after operation, the one stage procedure is now safer because it eliminates the dangers of two operations and two anesthesias as well as the difficulties often encountered with inflammatory adhesions at the second operation.

For lesions of the descending colon or rectum with uncontrolled distention on admission, cecostomy appears to be the treatment of choice. Prophylactic intubation in these cases is of course unnecessary. If no distention is present, the preliminary cecostomy can be avoided by use of the tube. Although a relatively simple operation, cecostomy may cause serious infections and often prolongs the period of hospitalization at least two or three weeks. The results in this group appear to justify our impression that some of the serious complications can be avoided. Our attending surgeons, however, have not accepted prophylactic decompression in the descending colon and rectal cases as enthusiastically as in cases of the ascending colon.

It is even more difficult to present clearcut data to show our impression that maintained decompression has prevented some of the complications that usually follow serious infections of the peritoneal cavity. Here again other factors have contributed to a general improvement of all our cases, but the following figures appear significant:

In the 1,075 cases of acute appendicitis with associated lesions treated during the five year period before the introduction of the Miller-Abbott tube (1933-1937 inclusive), 6.75 per cent (68 cases) were classified as diffuse or generalized fibropurulent peritonitis, with a mortality of 20.6 per cent. Of the 726 cases under treatment since the introduction of the Miller-Abbott tube (1938-1940 inclusive), 3.4 per cent (25 cases) were classified as diffuse or generalized fibropurulent peritonitis, with a mortality of 12 per cent. In other words, our complicated cases occur about one half as often, with approximately one half the previous mortality.

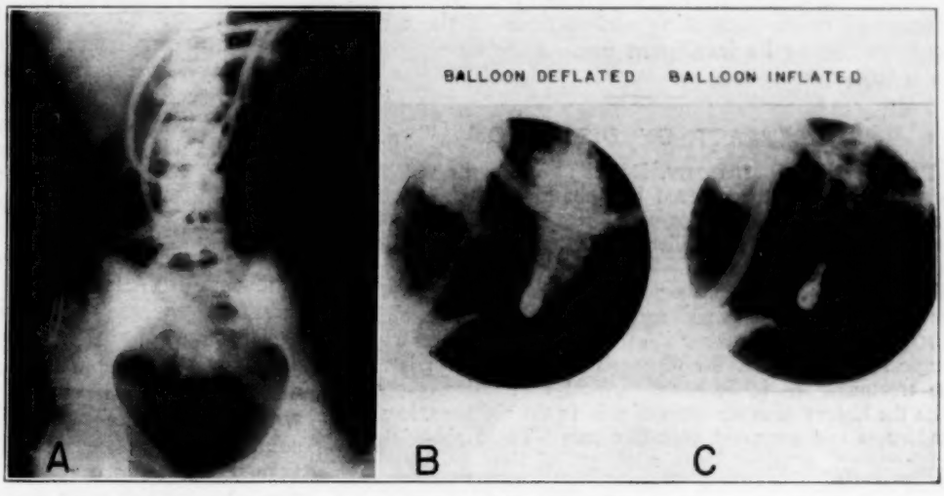


Fig. 3.—Generalized peritonitis with permanent obstruction following acute appendicitis. *A*, Plain roentgenogram of abdomen on eleventh hospital day showing Miller-Abbott tube arrested in left lower quadrant. Pressure roentgenograms at the point of obstruction after the injection of barium. *B*, with the balloon deflated and *C*, the balloon inflated. Patient maintained in satisfactory nutritional state by continuous suction and oral feedings until fibrous adhesions were divided at operation on thirty-fourth hospital day.

OBSTRUCTIONS WITH GANGRENE OF THE BOWEL

We continue to advise immediate operation in all cases suspected of gangrene of the bowel. Our criteria for suspecting gangrene are (1) a history of the sudden onset of pain that persists between the attacks of crampy, colicky pain, (2) localized tenderness or a palpable mass and (3) an elevated temperature, pulse and white blood cell count which do not return to normal after adequate fluids have been administered.

The mortality in this group continues at the same high figure as before the introduction of the Miller-Abbott tube. Three of the deaths occurred in cases in which there was profound shock when first seen, too late for any type of treatment.

Operations were unfortunately delayed on 3 patients in spite of the fact that several of the criteria for gangrene persisted after partial deflation and administration of adequate fluids. One is lulled into a false sense of security by the temporary improvement which follows intubation of the small bowel. Deflation can be extremely helpful if used intelligently during the short preoperative period required to prepare these patients for operation and in the usually stormy postoperative period that follows. Gangrene should be suspected on admission, and the apparent improvement that follows should not cause the surgeon to overlook his original diagnosis.

Gangrene of the bowel is an admitted hazard to intubation of the small bowel. However, this type of case comprises only 5 to 10 per cent of the total cases of ileus and is not a valid excuse for depriving the remaining 90 to 95 per cent of the cases of the advantages to be gained by it.

COMMENT

Intubation of the small bowel can be most successfully accomplished if it is supervised by some members of the staff familiar with the method. We do not wish to imply that the technic requires special training, but it does require considerable time and careful attention. In this hospital, one of the senior surgical residents and one of our graduate nurses have been assigned to the patients requiring intubation in the various parts of the hospital. With the constant cooperation of the members of the department of radiology, we have now attempted more than four hundred intubations with less than 10 per cent failures.

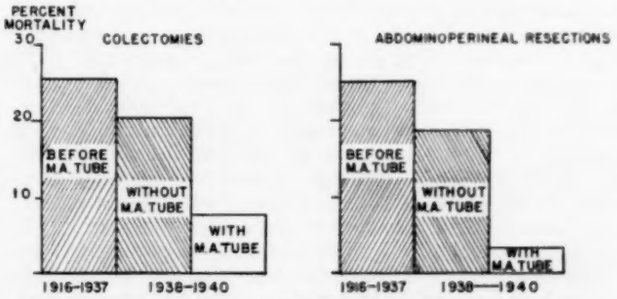


Fig. 4.—Radical resections of colon and rectum for carcinoma.

The busy surgeon of today is not expected to do the detailed work required for successful intubation, but

he must know that intubation of the small bowel cannot be successfully accomplished by haphazard attempts within a short period of time. A lack of understanding on the part of the attending surgeons has been responsible for the slow acceptance of this important contribution to abdominal surgery.

SUMMARY

Intubation of the small bowel in cases of intestinal obstruction has diagnostic and therapeutic value. Our mortality and morbidity rates for this condition have reached an all time low since the introduction of the Miller-Abbott tube.

2. Figures presented show that maintained decompression will reduce the mortality in cases of radical resection of the colon and rectum, and our impression is that maintained decompression will prevent the serious complications of serious infections of the peritoneal cavity.

3. Gangrene of the bowel continues to be an admitted hazard to intubation of the small bowel, but the possible harm that may be done in this small group of cases is not a valid reason for depriving the greater percentage of cases presenting obstructions of the advantages gained by its intelligent use.

630 West 168th Street.

ABSTRACT OF DISCUSSION

DR. GROVER C. PENBERTHY, Detroit: When the use of the long tube was first advocated by Johnston and Abbott there was skepticism in the minds of a great many because of the danger of relying on the Miller-Abbott tube as a possible cure-all for intestinal obstruction. There can be no doubt about the efficacy of the suction drainage by the Miller-Abbott tube in the great majority of acute and chronic obstructions and the obstruction due to adynamic ileus. The tube can never replace surgical treatment. If the diagnosis of strangulation is made, the treatment should be early surgical exploration, especially with the history of acute onset of pain in the abdomen, localized tenderness and recurrent colic-like pain. There should be no delay except to allow for a minimum of time for hydration, blood or plasma infusions. The immediate important problem is not the distention, although that may be troublesome. The primary difficulty is the inadequacy of the mesenteric blood supply. This can be accomplished only by surgical intervention. On the other hand, simple adynamic ileus should not be treated surgically. In a paper presented before this section in 1938 by our group it was stated that "the advantages of the method in properly selected cases are as follows: 1. It carries the patient past the period when operation is most dangerous. 2. It prepares the patient for operation by control of distention, thus making operation less traumatic for the patient and easier for the surgeon. 3. It affords a means of localizing the site of obstruction and frequently indicates its nature. 4. It permits oral feeding of the patient during a period when food and fluid are so essential and frequently has permitted us to improve the patient's nutritional state during the period of treatment. 5. It releases the tension above the site of obstruction and frequently reestablishes the normal passage of intestinal contents, thus permitting the patient to be operated on in the interval stage if advisable. 6. In the treatment of paralytic ileus this is the only method we know which can uniformly be depended on to relieve the distention of the small bowel, which is not uncommonly fatal. The disadvanges of the method are that: 1. It necessitates careful selection and evaluation of cases. It is not suitable for treatment of strangulated types of obstruction. 2. It requires hard work on the part of the surgeon and his associates. Passage of the tube and attention to details with regard to the patient and the equipment require continued attention. 3. It is not suitable for obstruction of the large bowel, since, despite the fact that the tube frequently traverses the entire intestinal tract, it cannot be depended on to reach the large bowel quickly enough to be of value."

ACUTE HEMOLYTIC STREPTOCOCCUS INFECTIONS COMPLICATING ADDISON'S DISEASE

TREATMENT WITH SULFADIAZINE AND ADRENAL CORTEX EXTRACT; REPORT OF TWO CASES

GEORGE W. THORN, M.D.
AND
ROGER A. LEWIS, M.D.
BALTIMORE

The susceptibility of patients with Addison's disease to acute infections of the upper respiratory tract is well known.[1] Despite the efficacy of adrenal cortex extract [2] in maintaining patients in good clinical condition, a relatively high incidence of infections of the upper respiratory tract, especially those caused by the hemolytic streptococcus, persists.

During the past year eight severe acute hemolytic streptococcus infections have occurred in a group of 50 patients with classic signs and symptoms of Addison's disease. The clinical course of the infection in all 8 patients was characterized by an abrupt onset with temperature rising to 104-106 F. within the first twelve to twenty-four hours. A striking fall in blood pressure usually occurred within the first twelve to thirty-six hours. Little or no leukocyte response was noted in the 4 patients who were hospitalized. Two of these patients died as a direct result of the streptococcic infection.

Sulfanilamide and sulfathiazole were used in the treatment of the 2 patients who died. It was thought that these drugs might prove efficacious, but unfortunately the toxicity of these compounds for patients with Addison's disease precluded their continued administration. From the clinical course of these patients, however, it seemed apparent that the newer and more potent adrenal cortical hormone preparations in conjunction with intravenously administered dextrose and saline solutions could be depended on to maintain plasma volume, blood pressure and blood dextrose level and thus prevent the early death (twenty-four to forty-eight hours) which so frequently terminated acute adrenal crisis. Thus, if an effective bacteriostatic of relatively low toxicity was available, one might reasonably hope for some success in treating this serious complication with combined glandular and antibacterial agents.

Recently we have had an opportunity to use sulfadiazine [3] in conjunction with adrenal cortex extract in the treatment of acute hemolytic streptococcus pharyngitis in 2 patients with Addison's disease (charts 1 and 2). The absence of nausea, vomiting and other toxic manifestations during treatment with sulfadiazine permitted adequate chemotherapy. The clinical response of these 2 patients was so striking in comparison to our previous experience in the treatment of this complication that we are recording in some detail the therapeutic measures which were employed.

Dr. Lewis is John D. Archbold Fellow-in-Medicine.

Dr. W. Barry Wood gave many valuable suggestions.

From the Chemical Division, Medical Clinic, the Johns Hopkins University and Hospital.

This study was aided by a grant from the Committee on Research in Endocrinology, National Research Council.

1. Rowntree, L. G., and Snell, A. M.: A Clinical Study of Addison's Disease, Mayo Clinic Monographs, Philadelphia, W. B. Saunders Company, 1931. Greene, C. H.: Clinical Use of Extract of the Adrenal Cortex, Arch. Int. Med. **59**: 759 (May) 1937. Greene, J. A., and Johnston, G. W.: Electrolyte Balance During Treatment, Crises and Severe Infection in Cases of Addison's Disease, ibid. **66**: 1052 (Nov.) 1940.

2. Thorn, G. W.: Treatment of Addison's Disease, Clin. Endocrinol. **1**: 76 (Jan.) 1941.

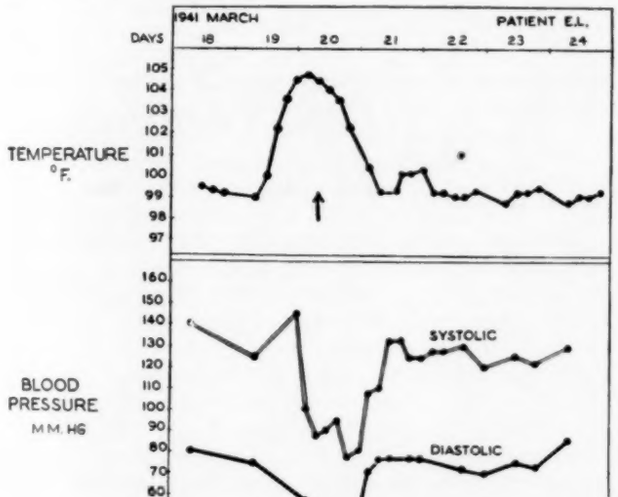
3. The sulfadiazine that was used in these studies was supplied by Dr. Perrin Long.

The purpose of treatment may be summarized as follows:

1. Support of plasma volume and blood pressure:
   - (*a*) Intravenous infusion of sodium chloride (0.9 per cent solution) and dextrose (5 per cent solution).
   - (*b*) Aqueous adrenal cortex extract (intravenously and subcutaneously).
   - (*c*) Synthetic desoxycorticosterone acetate in oil (intramuscularly).
   - (*d*) Epinephrine in oil, intramuscularly.
2. Prevention of hypoglycemia:
   - (*a*) Intravenous infusion of dextrose (1 *a*).
   - (*b*) Frequent feedings of readily available carbohydrate.
   - (*c*) Treatment with adrenal cortex extract to increase gluconeogenesis (1 *B*).[4]
3. Antibacterial chemotherapy:
   - (*a*) Intravenous administration of sodium sulfadiazine.
   - (*b*) Oral administration of sulfadiazine.

SUGGESTED OUTLINE OF THERAPY

1. Five hundred cc. of 0.9 per cent sodium chloride solution and 1,000 cc. of 5 per cent dextrose solution are given intravenously and repeated every eight hours (at the time of the initial venipuncture, blood is withdrawn for hematocrit, blood sugar, serum chloride and bicarbonate determinations).



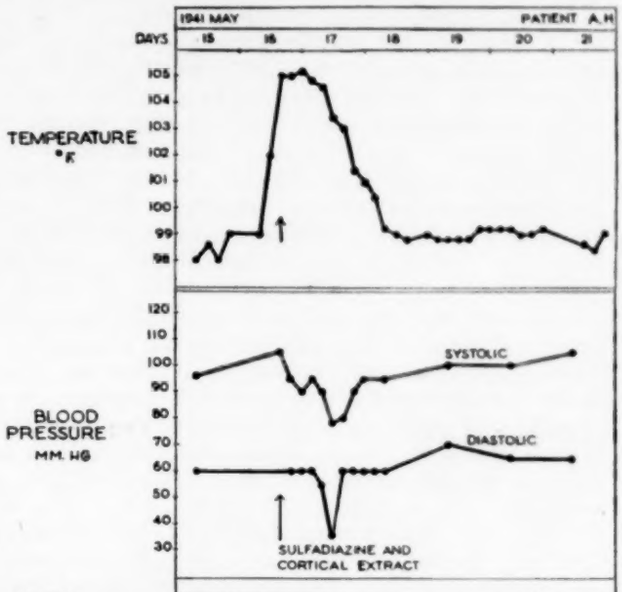
CORTICAL EXTRACT	CC.	0	5	55	35	30	17	12
DESOXYCORTICOSTERONE	MG.	0	0	15	10	10	5	3
SULFADIAZINE	GM.	0	0	10	5	4	4	3
TOTAL FLUID INTAKE	CC.	2000	1900	4800	3700	2400	2500	3500
SODIUM CHLORIDE I.V.	GM.	0	0	20	56	0	0	0
DEXTROSE I.V.	GM.	0	0	75	50	0	0	0

Chart 1.—Temperature and blood pressure of first patient. The initial dose of sulfadiazine was 4 Gm. of the sodium salt administered intravenously. The first dose of adrenal cortex extract was also given intravenously.

2. Twenty-five cc. of aqueous adrenal cortex extract is added to the intravenous infusion and in addition 10 cc. of extract is injected subcutaneously. The subcutaneous injection of 5 to 10 cc. of aqueous extract is repeated every two to three hours until the fever subsides.

3. Twenty mg. of desoxycorticosterone acetate in oil is injected intramuscularly in divided doses during the first twenty-hour hours, and 5 to 15 mg. given once daily thereafter.

4. Sodium sulfadiazine 4 to 5 Gm. is given intravenously. It is extremely important to administer the sodium sulfadiazine intravenously, as every effort should be made to establish an adequate blood level of the drug as rapidly as possible. Following this, 1 Gm. of sulfadiazine is given every four to six hours by mouth and the blood level is maintained at 10 to 20 mg. per hundred cubic centimeters as long as fever persists. If the oral dose is not retained, the blood level is maintained by giving 2 Gm. of sodium sulfadiazine intravenously at eight to twelve hour intervals. Frequent determinations of the blood level of the drug are indicated because of the strong fluctuation in fluid balance which may occur in these patients. It is also desirable to continue sulfadiazine therapy in smaller doses for five to seven days after the temperature has returned to normal (charts 1 and 2).



CORTICAL EXTRACT	CC.	0	12	37	39	16	8	0
DESOXYCORTICOSTERONE	MG.	0	5	5	25	25	25	25
SULFADIAZINE	GM.	0	7	8	5	4	3	3
TOTAL FLUID INTAKE	CC.	2500	2700	3500	2500	2200	1900	2000
SODIUM CHLORIDE I.V.	GM.	0	10	10	5	0	0	0
DEXTROSE I.V.	GM.	0	50	100	50	0	0	0

Chart 2.—Temperature and blood pressure of second patient. The initial dose of sulfadiazine was 4 Gm. of the sodium salt administered intravenously. The first dose of adrenal cortex extract was also given intravenously.

5. One cc. of epinephrine in oil injected intramuscularly at eight to twelve hour intervals is indicated if the level of systolic blood pressure is below 100 mm. of mercury.

6. Blood pressure determinations are made at intervals of one to two hours, day and night. Small quantities of fruit juice with added lactose, or ginger ale, are given at frequent intervals, if tolerated. Since 1,500 cc. of saline and dextrose solution is given intravenously every eight to twelve hours during the first two days, additional fluid by mouth is not essential. A daily blood specimen is taken for hematocrit, nonprotein nitrogen, blood sugar and sulfadiazine level. Hemodilution, excessive edema or hypertension is a definite indication for temporarily discontinuing injections of

4. Thorn, G. W.; Koepf, G. F.; Lewis, R. A., and Olsen, Elizabeth F.: Carbohydrate Metabolism in Addison's Disease, J. Clin. Investigation **19**: 813 (Nov.) 1940.

desoxycorticosterone acetate in oil and for reducing the amount of intravenous saline solution. On the other hand, hypotension, if accompanied by hemoconcentration, is a definite indication for increasing the dosage of desoxycorticosterone acetate in oil and the quantity of saline solution administered intravenously. If hypotension and generalized edema occur at the same time, it is wise to discontinue desoxycorticosterone acetate in oil therapy and resort to frequent injections of aqueous adrenal cortex extract (10 cc. every one to two hours). One cc. of epinephrine in oil may be injected intramuscularly and repeated if the systolic blood pressure continues to fall. Our experience with the unfavorable reaction of some patients with Addison's disease to transfusions suggests that this therapeutic procedure be withheld unless other measures fail.

SUMMARY

Acute hemolytic streptococcus infections continue to be one of the most frequent and serious complications which occur in patients with Addison's disease. Adequate sulfadiazine therapy was well tolerated by 2 patients with acute hemolytic streptococcus pharyngitis. The use of this drug in conjunction with adrenal cortical hormone appears to offer the most efficacious form of treatment now available for patients with Addison's disease with this type of infection. An outline of therapy is given, and the urgent need for immediate, constant and continued treatment is indicated.

PROTOCOLS

1. E. L.,[5] a woman aged 52, single, who had had Addison's disease for over two years, was in the Johns Hopkins Hospital for treatment of arthritis. On May 18, 1941, 5 pellets which had been implanted eleven months before were removed. Two days later the patient contracted a fever which was thought to be due to a recurrent cystitis. She was given a small dose of sulfathiazole but no additional therapy. The next morning her temperature had risen to 105 F. and her throat had become inflamed and edematous. Her blood pressure fell from 140 systolic and 80 diastolic to 78 systolic and 50 diastolic mm. of mercury and she became semicomatose. An infusion was started immediately and she was given 1,000 cc. of 5 per cent dextrose and 500 cc. of 0.9 per cent sodium chloride solution. She was also given 4 Gm. of sodium sulfadiazine intravenously and 1 Gm. of sulfadiazine by mouth. During the first twelve hours of treatment she received 55 cc. of aqueous adrenal cortex extract intravenously and subcutaneously, 15 mg. of desoxycorticosterone acetate in oil intramuscularly and 1 cc. of epinephrine in oil intramuscularly. With continued treatment the temperature gradually fell and the blood pressure returned to normal thirty-six hours after therapy had been instituted. Her convalescence was complicated by an attack of erythema nodosum.

The essential laboratory data were as follows:

On March 19, the initial date of infection, the hematocrit reading was 38.5 per cent volume of packed cells, the white blood cells 12,700, blood nonprotein nitrogen 30 mg. and blood dextrose 81 mg. per hundred cubic centimeters, the serum chloride 99 and the serum carbon dioxide combining power 28.5 milliequivalents per liter. A urine culture taken at this time was reported as being sterile; a throat culture revealed 85 per cent beta hemolytic streptococci. On March 20 the blood level of free sulfadiazine was 21 mg. per hundred cubic centimeters. On March 21 the white blood cells were 10,400. March 22 the hematocrit reading was 32.7 per cent volume of packed cells. On March 23 the throat culture showed normal throat flora.

2. A. H., a woman aged 21, married, who had been treated for Addison's disease for one year, was admitted to the hospital for reimplantation of pellets of desoxycorticosterone acetate. On the morning of May 16, 1941 she did not feel well and complained of a sore throat. At 4 p. m. the same day her temperature was 105 F. At this time the pharynx was inflamed and the tonsils were large and swollen. Treatment was immediately instituted, 4 Gm. of sodium sulfadiazine being given intravenously and 1 Gm. of sulfadiazine every four hours being given orally. At the same time she was given 15 mg. of desoxycorticosterone acetate in oil and frequent subcutaneous injections of adrenal cortex extract in addition to saline and dextrose infusions intravenously. During the first twelve hours of treatment the temperature remained elevated and the swelling and redness of the throat increased. Despite the presence of moderate generalized edema the blood pressure fell from 115 systolic and 75 diastolic to 72 systolic and 48 diastolic mm. of mercury. At this time 1 cc. of epinephrine in oil was given intramuscularly. During the second twelve hours of treatment there was a remarkable improvement in her general condition and during the second twenty-four hours of treatment the temperature fell to 98.6 F. (rectal) and the blood pressure gradually returned to normal.

The essential laboratory data were as follows:

On May 16, the initial date of infection, the white blood cells were 10,200 with polymorphonuclears 64 per cent, lymphocytes 29 per cent, myelocytes 6 per cent and eosinophils 1 per cent. A throat culture showed 75 per cent beta hemolytic streptococci. On May 17 the white blood cells were 8,200 and the blood level of free sulfadiazine was 10 mg. per hundred cubic centimeters. On May 19 the blood level of free sulfadiazine was 9 mg. per hundred cubic centimeters and on May 20 a throat culture revealed only normal throat flora.

5. The complete protocol appears in Thorn, Koepf, Lewis and Olsen.[4]

DIAGNOSTIC AND PROGNOSTIC VALUE OF THE ELECTROENCEPHALOGRAM

FREDERIC A. GIBBS, M.D.
BOSTON

Twelve years have passed since Berger[1] first described the electrical beat of the brain in man. In these twelve years workers all over the world have studied intensively the anatomic, physiologic and psychic correlates of the electroencephalogram.[2] More than six hundred articles dealing with this subject have been published and sufficient evidence has been accumulated to indicate the general significance of this new phenomenon and to show that it has practical value for the solution of clinical problems, and also that it has certain definite limitations.

Before proceeding further, I shall define electroencephalography: It is the technic of recording the electrical beat of the brain. As Berger pointed out, this beat is analogous to the beat of the heart as it appears in the electrocardiogram. The brain beat is entirely electrochemical, however; it has no appreciable mechanical component. In the normal waking state the brain does not beat as a single huge unit but as many small, more or less independent units with ill defined boundaries—somewhat like the heart in fibrillation. The voltage ordinarily obtained from the brain is about one hundredth as large as that obtained from the heart, which makes vacuum tube amplification necessary. Another difference between the electroencephalogram

From the Department of Neurology, Harvard Medical School, and the Neurological Unit, Boston City Hospital.

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1. Berger, Hans: Ueber das Elektrenkephalogramm des Menschen: I. Mitteilung, Arch. f. Psychiat. **87:** 527-570, 1929.

2. It is impossible in this short report to include references to the work of all those who have contributed to our present knowledge of this subject. A complete bibliography and proper distribution of credit will be found in the Atlas of Electroencephalography by F. A. Gibbs and E. L. Gibbs (Cambridge, Mass., Lew A. Cummings Company, 1941).

and the electrocardiogram is that the complex wave forms in the electroencephalogram, unlike those in the electrocardiogram, cannot be interpreted as due to the spread of a wave of excitation. In the electroencephalogram, complex waves are the result of superimposed beats from different types of functional units, for the brain is far from a homogenous organ—some units are large and some small, some slow and some fast. Another important difference should be noted: The electroencephalograph does not record activity at any great distance; only activity going on immediately under an electrode shows in the record. If electrodes are connected to the front and back of the head, for example, what is recorded is not the beating of the entire brain but the algebraic sum of the activity under the frontal electrode and under the occipital electrode.

The beating of the brain becomes faster and shallower with stimulation, and particularly with attention. It slows and develops a high amplitude with deep sleep. It becomes faster with increasing age and varies greatly from one person to another. It is about as labile as the facial expression but, like facial expression, tends to remain more or less characteristic for each individual. All this variation in normal subjects, however, makes interpretation difficult.

Diseases of the brain tend to produce definite disturbances in the brain beat, but unless the cortex immediately under the electrodes is disturbed abnormalities will not appear in the record. Thus it is difficult to detect and impossible to localize deep cerebral or cerebellar lesions. It is true, however, that a localized lesion may set off abnormal nerve impulses which produce a focus of disorder in a distant cortical field. On the other hand, if there are no functional connections extreme injury in one part of the brain may not manifest itself at all in another. The response of the brain to injury is in general nonspecific: Injury usually produces abnormally slow waves, and the worse the injury the slower the waves. At times, however, injury produces bursts of abnormally fast waves. The location of a brain tumor, area of trauma or a localized infection may be deduced from the part of the cortex that shows maximal disorder. When a lesion is truly cortical, such localizations are about 90 per cent accurate. As has been said, however, deep cerebral lesions and cerebellar lesions are ordinarily unlocalizable. Instead of the usual type of electrode that is pasted on the surface of the head, a nasal electrode has been recommended for localizing lesions at the base of the brain, but as yet no adequate series has been collected to show how accurate such deep localizations are. Electroencephalography has these advantages over the injection of air and roentgenography. It is absolutely painless and perfectly safe. On the other hand, in the general run of brain tumors it does not give as accurate a localization as the injection of air and roentgenography. Nevertheless, when used by a competent diagnostician, it can save a certain number of patients the necessity of the injection of air, and in some cases in which, despite all other procedures, a satisfactory localization cannot be arrived at, the electroencephalogram will provide crucial evidence leading to a correct localization. The over-all accuracy of the electroencephalographic localization of gross intracranial lesions is about the same as the accuracy of localization from the neurologic examination.

Probably the greatest economic advantage of electroencephalography lies in its usefulness in cases of head injury. Such cases not only form a large fraction of neurologic practice but they are beset with various legal complications which make the clinician feel acutely the need for an objective record of function of the central nervous system. Such a record is provided by the electroencephalogram. It can show the extent to which function of the central nervous system has been impaired, the imminence of convulsions and whether the patient is improving or getting worse.

In various conditions in which the nature of the disease is known and also the general areas that are involved, it is nevertheless desirable to know the extent and degree of cortical involvement. In Sydenham's chorea, for example, cortical involvement is fairly common, but in any given case the neurologist may wish to know whether this has occurred. So also with epidemic encephalitis and meningitis.

In all the conditions mentioned thus far electroencephalography is used as an auxiliary technic. In the diagnosis and understanding of epilepsy electroencephalography is of primary importance. Epilepsy is associated with extreme and obvious modifications of the cortical beat not only at the time of a seizure but in intervals between seizures. In grand mal attacks the beat becomes too fast, in psychic seizures it is too slow and in petit mal attacks there is a kind of gallop rhythm, a three per second alternation between fast and slow. Unfortunately, about 10 per cent of the supposedly normal population has cerebral dysrhythmias, and these are only slightly or not at all different from the interseizure dysrhythmias of epileptic patients. Thus it is hazardous to make a diagnosis of clinical epilepsy from the electroencephalogram. I believe, however, that these cases of asymptomatic dysrhythmias are in fact cases of asymptomatic epilepsy. Only the severest dysrhythmias in a person are clinically evident and only especially severe cases of cerebral dysrhythmia in the population manifest themselves as clinical epilepsy. When the incidence of convulsions is higher than that in the normal population, for example, in the parents and near relatives of epileptic patients or in the lowest grades of feeblemindedness, the incidence of dysrhythmias is proportionately higher.

Severe cerebral dysrhythmias are at times encountered in persons with an unusual type of gastric complaint. This finding suggests that the difficulty is cerebral rather than gastric. Cases of uncontrollable rage or negativism at times show exacerbations of cerebral dysrhythmia correlating with the outbursts. Many problem children show abnormalities similar to those encountered in epileptic patients with psychic seizures. The physician can make practical use of these facts if he considers the possibility that almost any type of bizarre behavior may be the result of cerebral dysrhythmias. The behavior in some cases, however, is not so bizarre. Occasional cases of stuttering are due to petit mal, and also cases of inattention or gross carelessness. Extreme belligerence or abusive speech which might be considered normal is at times a manifestation of a psychic seizure.

In the treatment of epilepsy, the electroencephalogram is helpful because it tells the amount and type of disorder that is present. On the amount of disorder depends the chance of successful therapy. On the type of disorder depends whether phenobarbital or sodium diphenyl hydantoinate is likely to be more useful. In all cases, however, the only way to tell which therapy will work best is to try them. The final treatment of epileptic patients is much the same in a clinic with

an electroencephalograph as in one without. The advantage for the former lies chiefly in greater ease and accuracy of diagnosis and classification and a better comprehension of the basic features of this condition.

Thus far little has been said about what electroencephalography cannot do. It cannot at present be used to diagnose manic-depressive psychosis, schizophrenia, feeblemindedness, migraine or psychoneurosis. It cannot detect loss of brain substance unless the mass of tissue which has been lost is very large, for what is recorded is activity, and when a part of the cortex has died and ceased to function it is hardly missed in the great welter of activity that still remains.

What is the future of electroencephalography? It will be used in an increasing number of clinics and hospitals, as at present it is being used for the diagnosis of cortical dysfunction and the localization of intracranial lesions. But new uses will appear as more quantitative data are obtained. A method devised by A. M. Grass makes it possible to transform the electroencephalogram from a complex mixture of waves into a chart showing the exact amount of energy in each frequency. With such quantitative data, it is easy to consider a statistically significant series of cases, to establish standards of normal and abnormal and to show degrees of correlation. Thus, it will be seen that quantitative electroencephalography is now possible. This development is likely to be of more practical importance for the psychologist and the mental tester than for the physician. Work now in progress, however, indicates that with greater refinement in technic and better standards of normal certain characteristic abnormalities will be found in schizophrenia.

SUMMARY AND CONCLUSIONS

The electroencephalogram is of clinical value in:

Epilepsy for diagnosis, localization, prognosis and regulation of treatment.

Narcolepsy for diagnosis.

Brain tumor for diagnosis and localization.

Subdural hematoma for diagnosis and localization.

Brain trauma for diagnosis, localization and prognosis.

Brain abscess for diagnosis and localization.

Meningitis for prognosis (residuals).

Encephalitis for diagnosis and prognosis.

Sydenham's chorea for prognosis (cortical involvement).

Schilder's disease for diagnosis.

Behavior disorders for diagnosis and prognosis.

The electroencephalogram at present has only negative value in schizophrenia, manic-depressive psychosis, feeblemindedness, migraine and psychoneurosis.

Interpretation of the electroencephalogram is difficult because of the complexity and variability of the wave forms in a given person, the variation with age and the wide range of patterns within a given age group.

In the future, electroencephalography will be increasingly applied to clinical problems. Accumulated data will make interpretation easier and more accurate. Quantitative analysis will establish standards for different ages and sexes and will probably reveal significant abnormalities in patients with schizophrenia and some other conditions which at present are supposed to be unassociated with abnormalities in the electroencephalogram.

Boston City Hospital.

ABSTRACT OF DISCUSSION

EDWARD J. BLADES, PH.D., Rochester, Minn.: Dr. Gibbs has pointed out the value of electroencephalography from a diagnostic and prognostic point of view. Although the first publication on electroencephalography by Berger dates back only twelve years, the bibliography of more than six hundred articles is indeed indicative of the thought and energy with which the subject is being explored, and it is no exaggeration to say that many thousands of electroencephalograms are at present being studied in an endeavor to evaluate fully the clinical use of electroencephalography. To those interested in becoming better acquainted with the various types of electroencephalograms I recommend the "Atlas of Electro-Encephalography" published about three months ago by Dr. and Mrs. Gibbs. Dr. Gibbs and his group in Boston have been particularly interested in the study of dysrhythmias and cortical dysfunction, whereas at the Mayo Clinic more attention has been paid to the possibilities of the localization of lesions by electroencephalography. In our experience the electroencephalogram has proved to be of definite value in the diagnosis and prognosis of epilepsy and has been applied, for example, in follow-up examination of some patients who have petit mal epilepsy and are on a ketogenic diet. In regard to the detection and localization of deep cerebral and cerebellar lesions, my colleagues and I believe that many lesions of this type can be localized approximately by examining the electroencephalogram for delta activity that appears bilaterally. For instance, tumors of the posterior fossa are usually associated with bilateral delta activity in the occipital, parietal and temporal areas. This, of course, presupposes that a deep seated lesion can cause a disturbance in the cortex, as the electrical activity actually recorded is only from areas approximate to the electrodes. It is our practice to place sixteen electrodes on the head, in the frontal, motor, anteroparietal, postparietal, occipital, cerebellar and temporal areas, on both sides of the head and both ear lobes, to record routinely on four channels from twenty to thirty minutes and to use both bipolar and monopolar leads. These records are proving to be most useful for study and it is only by the examination of complete records that electroencephalography will be able to maintain the pace already set in the first twelve years of its existence.

DR. MICHAEL M. MILLER, Lexington, Ky.: Since it is well known that the prognostic determinations in cases of functional psychoses and neuroses depend a great deal on the extent of deterioration of the intelligence, I should like to ask Dr. Gibbs whether this method has been studied with regard to the question of determining the extent of cerebral deterioration.

DR. FREDERIC A. GIBBS, Boston: I am glad that Dr. Blades pointed out that it is difficult to localize deep lesions by the technic of electroencephalography as ordinarily employed. I have found it impossible to localize deep tumors or cerebellar tumors. This is because with the usual leads only the activity of the cortex is recorded. Various injuries in the basal ganglions, for instance, although associated with very evident clinical disorders, show no abnormalities at all in the electroencephalogram. Dr. Blades told us that workers at the Mayo Clinic are using the finest possible discrimination on records from cases in which there are deep lesions in the effort to see whether something cannot be found in the electroencephalogram which will allow localization of the lesion. They recognize that they will have to use quite different criteria from those which we and they have used in localizing cortical lesions. It is encouraging to hear that they are meeting with success. They cannot as yet tell us what their accuracy with deep lesions will be, but they have told us that in localizing cortical lesions they have an 80 or 90 per cent accuracy. In order to answer Dr. Miller's question I will read a list of the conditions in which the electroencephalogram is of clinical value. It is definitely useful in epilepsy, brain tumor, concussion, brain trauma, subdural hematoma, encephalitis, meningitis and brain abscess; it is of some value in thyroid disease, cerebral arteriosclerosis, narcolepsy, behavior disorders and dementia paralytica. It is at present of no practical value in schizophrenia, manic-depres-

sive psychosis, multiple sclerosis, parkinsonism (when there is no cortical involvement), choreoathetosis, migraine, psychoneurosis and undifferentiated feeblemindedness, and when I get to undifferentiated feeblemindedness I get to the point which Dr. Miller brings up. It is extraordinary what severe degrees of dementia can occur with a normal appearing electroencephalogram, and it is incorrect to suppose that for every psychic change there is some electroencephalographic equivalent. Continuous very slow waves may be found in a man who is standing at the top of his class and a normal record in an individual who has never learned to eat and has never spoken. There are some tremendous discrepancies, and we must continue our study in order to find out just what is at the basis of them. For what at present may seem like annoying inconsistencies may, when explained, prove to be the key to a better understanding of central nervous function.

Clinical Notes, Suggestions and New Instruments

ANAPHYLACTIC SHOCK WITH HEMOCONCENTRATION TREATED INTRAVENOUSLY WITH SALINE SOLUTION

HARRY BLOTNER, M.D., BOSTON

The subject of shock, whether it is surgical or medical, is of unusual interest today. Recently I treated a patient in severe anaphylactic shock. The picture resembled so closely that of surgical shock that it appears of interest to present the details of this case. Ordinarily the treatment of anaphylactic shock is not considered in relation to the blood picture, as it is in cases of surgical shock. I believe that the treatment, based on hemoconcentration and decreased blood volume, was effective and that the method used is of practical significance.

It is generally regarded now that an essential feature of shock is a relative decrease in the circulating blood volume compared with the size of the vascular system. Such an inequality may be brought about by a loss of fluid from the circulation or by an increase in the size of the vascular bed. When fluid is lost a concentration of the blood results, which may be noted by an increased count of the red blood corpuscles or by an elevated hematocrit reading. Excellent reviews of this subject have been given recently by Moon,[1] Dunphy,[2] Stead[3] and Janeway.[4]

LITERATURE

There have been reports in the literature showing an increased concentration of the blood and a decreased volume of blood in cases of anaphylactic shock. Dean and Webb[5] reported an increase in the hemoglobin content and red blood cell count during anaphylactic shock in dogs. Wyman and tum Suden[6] noted reductions in the plasma volume in rats depending on the severity of the anaphylaxis. In 1 rat, the plasma volume was reduced 63 per cent in sixty-two minutes after injection of serum. Simonds[7] found hemoconcentration and decreased blood volume during anaphylactic shock and during intoxication with peptone in dogs. Drinker and Went[8] found a low blood volume in guinea pigs with severe anaphylactic shock which, however, they believed was due to poor mixing of the injected dye. Eppinger and his associates[9] found an increased erythrocyte count incident to acute urticaria. Black and Kemp[10] observed an increased specific gravity of the blood during an acute reaction to ragweed pollen in man and during anaphylaxis in guinea pigs, the degree of which paralleled the severity of the reaction in the animals. Meyler[11] reported hemoconcentration in 2 cases of extensive serum disease in man. In the first instance a patient with ulcerative colitis was given large quantities of antidysentery serum and an extensive serum rash and a clinical picture of shock developed, during which the red blood cell count rose from 4,500,000 to 6,000,000. It was impossible to determine the blood volume, because when congo red was injected it disappeared from the blood into the urticarial wheals, which became fiery red. This was a good demonstration of increased permeability of vessels. In the second case of ulcerative colitis general urticaria and shock developed fifteen minutes after a transfusion. The red blood cells increased from 3,900,000 to 7,000,000 during the period of shock. Anaphylaxis may be regarded as an example of true shock, and its circulatory phenomena have been ascribed to increased capillary permeability by Manwaring and his associates,[12] Seegal[13] and Lewis.[14]

REPORT OF CASE

A. F., a man aged 22, was seen for the first time on July 24, 1941 in consultation with Dr. J. J. DiSalvo at the Clover Hill Hospital, Lawrence, Mass., because of severe anaphylactic shock. The entire history of the patient is irrelevant except that about three or four years before he had received a dose of tetanus antitoxin. He had had no cardiac irregularity when examined by his physician on previous occasions.

July 24 at 12:10 p. m. the patient was given as a prophylactic 1,500 units of tetanus antitoxin intramuscularly. He stayed at the physician's office for about twenty minutes and had no apparent ill effects. The patient then went about his routine and at 1:30 he felt an itch in the suprapubic region and noticed what looked like a small blotch. Two minutes later a blotch appeared on the forehead, which was followed by a rash on the whole face. He went back to his physician at 1:55. His face, arms and feet became swollen and a rash developed over the body. At 2:15 he received 5 minims (0.3 cc.) of epinephrine subcutaneously. He became unconscious but the urticaria and the swelling diminished. In about five minutes it was necessary to administer ten minims (0.6 cc.) of epinephrine subcutaneously. The patient was cold and clammy and perspired profusely. The pulse was not perceptible. The blood pressure was 30 systolic and 0 diastolic or less. In another few minutes he was given again 10 minims of epinephrine intravenously and he improved very slightly. Shortly thereafter he became worse and 10 minims of epinephrine was injected intravenously on two occasions. In addition, there were administered an ampule of nikethamide by injection and ephedrine sulfate 50 mg. orally. The blood pressure increased to about 80 systolic and 40 diastolic. The patient was not alert. Vision was blurred. He had nausea and pain in the epigastrium and vomited several times. He was sent to the hospital at 5 o'clock by ambulance because of his critical condition. On arrival, he was given 1,000 cc. of 10 per cent dextrose intravenously and later ephedrine sulfate 25 mg. by this route.

Physical examination at 8:30 showed that the patient was critically ill and was gasping for breath. The pulse was rapid and thready, with a rate of about 160 a minute. The blood pressure was 50 systolic and 30 diastolic, with some variations above and below this level. The heart sounds were weak and a rare extrasystole was present. Murmurs were not heard.

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The lungs showed no rales. The abdomen was normal. The reflexes were normal. The liver and spleen were not palpable. The arms, hands and feet were noticeably edematous. The arms were about one and one-half times their normal size. There was an urticarial rash over the body. A puncture wound was present on the sole of the left foot. The patient obviously was in severe anaphylactic shock.

Because of the possibility that there might be some similarity between anaphylactic shock and surgical shock and that this might be noted by the concentration of blood, a red blood count was made immediately and this was found to be 6,910,000. The hemoglobin level was 100 per cent + (Tallqvist). Because of this hemoconcentration, physiologic solution of sodium chloride was given intravenously immediately. When 500 cc. had been introduced into the circulation, the patient began to feel better. The blood pressure began to rise to a level of approximately

Laboratory Data on Patient in Anaphylactic Shock *

Date	Hemoglobin, per Cent	Red Blood Cells	Serum Protein, Gm. per 100 Cc.	Comment
July 24.....	..	....	...	In shock at 2 p. m., 1,000 cc. 10% dextrose intravenously 5:45 to 6:45 p.m.
9:00 p. m.	100+	6.91	...	B. P. 50/30, pulse 160, moribund
9:35 p. m.	..	....	...	2,000 cc. physiologic solution of sodium chloride intravenously from 9:35 to 11:30 p. m.; much improved
11:55 p. m.	..	5.70	...	B. P. 118/70, pulse 108
July 25 5:30 a. m.	85	5.00	...	Pulse 90-110, B. P. 118/50, temperature 100 F.
11:15 a. m.	80	4.61	...	
July 26.....	..	4.82		
July 27.....	..	4.60	...	Pulse 60-84, B. P. 100-130/40-70
July 28.....	..	5.17	5.5	Temperature 99.6, pulse 78, extrasystoles
July 30.....	80	4.49	...	B. P. 130/60
August 1....	80	4.94	6.2	Pulse 60, B. P. 120/55
August 6....	90	5.26	8.3	Pulse 60; out of bed
August 9....	90	4.98		
August 15...	85	5.26	7.2	Temperature 98, pulse 62, B. P. 118/65
August 21...	85	5.41	7.4	Home

* Red blood cells recorded in millions; white blood cells ranged from 7,900 to 12,200; other serum percentages were:

	Albumin	Globulin	Nonprotein Nitrogen	Chloride
July 28.....	3.5 Gm.	2.0 Gm.	29 mg.	330 mg.
August 15.....	3.4 Gm.	3.8 Gm.	21 mg.	424 mg.
August 21.....	4.8 Gm.	2.6 Gm.	37 mg.	321 mg.

100 systolic and 70 diastolic and the pulse rate began to drop to 110. One liter of saline solution including 10 cc. of 10 per cent calcium chloride was given intravenously in fifty minutes and frequent examinations of the lungs showed no rales. Subsequently, another liter of saline solution was given intravenously, and during this period also no rales appeared.

The 2 liters of saline solution was administered continuously from 9:35 to 11:30 p. m. During this time epinephrine 1 cc. was given subcutaneously. By 11:30 the pulse dropped to 108, the blood pressure rose to 118 systolic and 70 diastolic and the patient appeared considerably improved. During the night red blood cell counts were made. At 11:55 the red blood cell count had dropped to 5,700,000, at 5:30 a. m. to 5,000,000 and at 11:15 to 4,610,000. During the night frequent blood pressure readings were taken and they showed some variations. The patient's mind was rather blank during the period of acute therapy, although he does remember that he was short of breath, that it was difficult for him to breathe and that he knew he was getting injections.

Theoretically, it would be ideal to give plasma in a state of shock without hemorrhage, because there is a considerable loss of plasma from the circulation. It might have been even more effective than saline solution in this case, since there is evidence for the loss of plasma in anaphylaxis. However, it was not given in this instance because saline solution could be administered without delay and after saline solution was given plasma was not needed.

On July 25 the patient appeared much improved. The rash had almost disappeared, although he still had some edema of the hands and lips. The pulse was between 90 and 110 and the blood pressure was 118 systolic and 50 diastolic. The lungs were clear. The heart was normal except for rare extrasystoles. The reflexes were normal. The patient's progress in the hospital was satisfactory. He took orally ephedrine sulfate 50 mg. twice a day until August 4. For the first few days he complained of frontal headache and dizziness when raising his head from the pillow. An occasional blotch appeared periodically until shortly before discharge. On and after July 27, the blood pressure varied from 100 to 130 systolic and 50 to 70 diastolic and the pulse from 84 to 60. On July 28, a frequent irregularity of the heart developed consisting of extrasystoles, and two days later he had some dull precordial pain of less than fifteen minutes' duration. Roentgenograms of the chest were negative on August 9. He was discharged from the hospital feeling well on August 16. Subsequently, he has been active and well, although he has continued to have rare extrasystoles.

LABORATORY DATA

The various laboratory data obtained are presented in the accompanying table. It was of interest to find that the patient's blood was concentrated during the stage of shock and then dropped to normal in a few hours after treatment with saline solution intravenously and remained at a normal level during his stay at the hospital. It was interesting, too, that the serum protein which was determined on July 28 was diminished to a level of 5.5 Gm. per hundred cubic centimeters. Subsequent determinations showed the serum protein to rise as the patient progressed and improved until it reached a level of about 7.4 Gm.

Electrocardiograms, 4 leads, were taken on July 30, August 5 and 15 and September 13. On each occasion the heart rate was approximately 60 and lead 4 was normal. On the first date, the tracings showed frequent auricular extrasystoles and notched P waves which were broader than normal, of 0.12 second's duration and 1 mm. high. T_3 was flat. On August 5 and 15, the P waves remained the same but the extrasystoles were rare and T_3 was 2 mm. high. On September 13, the P waves were of normal width and of 0.08 second's duration, although still slightly notched. Rare auricular extrasystoles were present. T_3 was the same as on the previous occasion.

The significance of these electrocardiographic changes are questionable. However, there have been reported certain electrocardiographic irregularities in the heart and also hemorrhages beneath the endocardium and in the auriculoventricular bundle in association with anaphylactic shock in animals. In dogs in dehydration shock Davis[15] found a dry pericardial sac and hemorrhages in the subpericardium in the region of the coronaries and beneath the endocardium of the auricles and ventricles.

Auer and his associates[16] and others[17] observed that electrocardiograms in certain animals during anaphylactic reactions revealed strong and various changes of the heart's activity such as heart block, abnormal relation of P and T waves, disappearance of T and P waves, ectopic beats, large S and negative T waves, broad R and S waves and auricular fibrillation. In addition, Criep[18] found changes in the T waves like those noted

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in coronary occlusion and suggested the possibility that the disturbance in the cardiac mechanism may be due to myocardial anoxemia. In man deLavergne and his associates[19] noted a transitory Stokes-Adams syndrome with brachycardia eight days after the injection of antistreptococcus serum for erysipelas, at which time serum sickness developed. Also, Harkavy[20] observed certain cardiac arrythmias and angina pectoris in 3 patients when offended by certain allergens. The relation of the changes in the electrocardiograms to the anaphylactic shock in our case is conjectured. Nevertheless, there were abnormally broad P waves and flat T_3 shortly after the shock which returned to normal later.

SUMMARY

A man aged 22 had severe anaphylactic shock two hours after an injection of tetanus antitoxin. The patient was gravely ill and laboratory examinations showed hemoconcentration with a red blood count of 6,910,000. On this basis, he was given 2,000 cc. of physiologic solution of sodium chloride intravenously during a period of two hours, which resulted in dramatic improvement with recovery. The red blood cell count dropped to 5,700,000 at the end of this therapy, to 5,000,000 within six hours and to 4,610,000 within twelve hours of administration of saline solution.

It is suggested that physicians give saline solution intravenously to patients in severe anaphylactic shock along with other routine therapy.

189 Bay State Road.

THE VALUE OF SULFATHIAZOLE OINTMENT IN THE TREATMENT OF PYOGENIC INFECTIONS OF THE SKIN

L. H. WINER, M.D., AND E. A. STRAKOSCH, M.D.
MINNEAPOLIS

Among the pyogenic infections of the skin, impetigo contagiosa is the most superficial and also the most common. A great deal of controversy has existed concerning the etiology of impetigo contagiosa as to whether it was caused by streptococci or by staphylococci. Recently White[1] revived the discussion of Sabouraud's claim that every case of impetigo contagiosa is of streptococcic origin. The history of this controversy is based on the work of Sabouraud,[2] Dohi,[3] Lewandowsky,[4] Tachau[5] and Epstein.[6] It is now established by the work of Engman,[7] Dohi, Lewandowsky, Jadassohn and his school and the more recent work of Epstein that impetigo may be of either streptococcic or staphylococcic origin.

The remedies recommended for the treatment of impetigo contagiosa are legion. This fact proves that none of them is entirely satisfactory. Ammoniated mercury ointment in 1 to 5 per cent strength has probably been the most widely used remedy. Besides failing frequently in the treatment of staphylococcic impetigo, it often causes dermatitis. Drying lotions or suspensions such as cinnabar lotion, gentian violet or silver nitrate solution are frequently used. These have the disadvantage of discoloring the skin, and silver nitrate solution often causes pain.

All these medicaments and their combinations had their place in the therapy of pyogenic infections of the skin as long as there were no specific antistreptococcus or antistaphylococcus drugs. But since it has been found that sulfanilamide is highly effective and specific against streptococcic infections and sulfathiazole against streptococcic and staphylococcic infections, there are specific chemicals which should be given first place in the attack against these infections.

The time required to cure impetigo contagiosa with the previous conventional therapy was from twelve to sixteen days, even in the hands of the most expert. Using sulfathiazole, we attempted to reduce the period of treatment.

Preliminary experimental[8] work showed that the bacteriostatic effect of sulfathiazole was not diminished in the proper ointment bases and was most effective in a water in oil emulsion, when the base was either cholesterinated petrolatum (aquaphor) or cod liver oil ointment. Therefore we used a 5 per cent sulfathiazole in the bases mentioned and also treated a separate group of patients with sulfathiazole by mouth only, without any local applications.

In this study 60 patients with impetigo contagiosa were treated. The ages and sexes were equally distributed among the three types of treatment used in the experiment. The ages of patients varied from 8 months to 14 years. All stages of impetigo lesions were treated. The majority of patients were hospitalized for stricter observation. In a small number of patients ambulatory treatment was instituted. Twenty patients were treated with 5 per cent sulfathiazole in aquaphor. The ointment was applied two or three times a day and on small children was covered with a bandage. The time necessary for complete treatment varied from two and a half to six days (1 case only taking nine days), the average being four and four-tenths days for cure. Twenty patients were treated with 5 per cent sulfathiazole in cod liver oil ointment (cod liver oil 7.5, concentrated cod liver oil 0.12, hydrous wool fat 4 and petrolatum to make 30 parts) with an average of four and eight-tenths days for cure. Twenty patients were treated orally without any local treatment. These patients received 1.5 Gm. (3 tablets) daily under the age of 6 years and 2.5 Gm. (5 tablets) daily if over the age of 6 years. The average time required for cure was nine and one-half days.

COMMENT

From our observations it can readily be seen that the local application of sulfathiazole in ointment form definitely reduced the time necessary to treat impetigo contagiosa. At no time was there any local or general reaction to the applications. Although there were no reactions following the oral administration, the time required for cure was twice as long as with the local application, and the possibility of toxic manifestations was always present. One ounce (30 Gm.) of 5 per cent sulfathiazole ointment (1.5 Gm. of sulfathiazole) was usually sufficient for complete cure of impetigo contagiosa. The oral medication required about 14.25 Gm. of sulfathiazole per patient.

CONCLUSIONS

1. We propose the use of 5 per cent sulfathiazole ointment in a suitable base for the treatment of impetigo contagiosa.

2. The treatment is more agreeable and cleaner than were former treatments.

3. The time required is considerably shorter than that with previous treatment.

4. The treatment is apparently free from dangerous sequelae.

505 Medical Arts Building.

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From the Department of Dermatology and Syphilology, University of Minnesota, Dr. H. E. Michelson, director, and the Department of Dermatology and Syphilology, Minneapolis General Hospital, Dr. S. E. Sweitzer, chief.

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Special Article

TYPHOID IN THE LARGE CITIES OF THE UNITED STATES IN 1940

TWENTY-NINTH ANNUAL REPORT

In anticipation of an opportunity to reassemble the number of deaths from typhoid in each of the ninety-three cities which have been included in these reports in previous years, and in order to recalculate the rates in light of the 1940 census figures, each health officer was requested to furnish the number of deaths from typhoid, both among residents and among nonresidents for each of the last eleven years, 1930 to 1940 inclusive. This procedure demonstrated how difficult is the task of obtaining for such summary figures which are altogether comparable with those secured for previous years. Many clerical errors were evident which required much correspondence and, for some cities, the rechecking of local records and original certificates. The practice regarding reallocations has varied both by time and by place, adding to the confusion. It has been our

TABLE 1.—*Death Rates of Fourteen Cities in New England States from Typhoid per Hundred Thousand of Population*

	1940	1939	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Worcester	0.0	0.0	0.2*	0.5*	1.0	2.3	3.5	5.0	11.8
Cambridge	0.0	0.0	0.2*	0.8	2.1	4.3	2.5	4.0	9.8
Fall River	0.0	0.0	0.2	0.2	2.2	2.3	8.5	13.4	13.5
Lynn	0.0	0.0	0.2	0.2	1.5	1.6	3.9	7.2	14.1
Waterbury	0.0	0.0	0.2	0.4	1.2	1.0	8.0	18.8	....
Springfield	0.0	0.0	0.3*	1.1†	0.4	2.0	4.4	17.6	19.9
New Bedford	0.0	0.0	0.4	1.1	1.5	1.7	6.0	15.0	16.1
Lowell	0.0	0.0	0.4	1.2	2.6	2.4	5.2	10.2	13.9
Hartford	0.0	0.0	0.5	1.0†	1.3	2.5	6.0	15.0	19.0
New Haven	0.0	1.2†	1.0	0.7†	0.6	4.4	6.8	18.2	30.8
Boston	0.1*	0.4†	0.3†	0.6	1.2	2.2	2.5	9.0	16.0
Providence	1.2	0.4	0.6	1.1†	1.3	1.8	3.8	8.7	21.5
Bridgeport	2.0	0.0	0.4	0.3	0.5	2.2	4.8	5.0	10.3
Somerville	2.0	0.0	0.6	0.4	1.3	1.6	2.8	7.9	12.1

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.

expressed intent to include all typhoid deaths, both resident and nonresident, but in spite of this declaration some health officers have entirely omitted nonresident deaths for allocations made within the state. Common denominators for purposes of comparison cannot be obtained in this way. Now that the death rates have been corrected on the basis of the 1940 census, it will probably be advisable in future reviews to build tables on the basis of resident deaths. This could not be done in the early reviews for want of a common reallocation practice. Some health officers reported cases instead of deaths, but such error became immediately apparent. Less evident was the occasional inclusion of the paratyphoids in spite of instructions to the contrary. Many health officers need pay more attention to statistics sent out from their departments, the accuracy and completeness of which are too frequently left to a casual clerk.

The estimated population on July 1 of each year, 1930 to 1939, was employed in determining rates. These estimates were furnished by the Bureau of the Census. For 1940 the provisional census data were used, since the Bureau has not made population estimates for cities as of July 1, 1940.

Paratyphoid has again been excluded. In tables 1 to 8 inclusive (as well as in table 10) a special note has been made of cities in which all deaths occur among nonresidents. As far as possible this practice has been

TABLE 2.—*Death Rates of Eighteen Cities in Middle Atlantic States from Typhoid per Hundred Thousand of Population*

	1940	1939	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Yonkers	0.0	0.0	0.3	0.7	0.5	1.7	4.8	5.0	10.3
Buffalo	0.0	0.2	0.1	0.6	2.7	3.9	8.1	15.4	22.8
Rochester	0.0	0.6†	0.3†	0.4	1.7	2.1	2.9	9.6	12.8
Scranton	0.0	0.7	0.3	1.4	1.8	2.4	3.8	9.3	31.5
Reading	0.0	0.9	0.5	0.4	1.6	6.0	10.0	31.9	42.0
Newark	0.0	0.9	0.3	0.4	0.9	2.3	3.3	6.8	14.6
Utica	0.0	1.0*	0.2*	0.2	1.1	3.9#	...	....	....
Erie	0.0	1.7†	0.7†	1.2	0.9	2.3	6.9	49.0	46.6
Camden	0.0	2.5*	1.4†	2.7	4.4	5.9	4.9	4.5	4.0
New York	0.1	0.2	0.3	0.8	1.3	2.6	3.2	8.0	13.5
Pittsburgh	0.4	0.4†	0.7	0.9	2.4	3.9	7.7	15.9	65.0
Philadelphia	0.6	0.6†	0.8	0.9	1.1	2.2	4.9	11.2	41.7
Jersey City	0.7†	0.0	0.6	0.3	0.9	2.7	4.5	7.2	12.6
Paterson	0.7	0.7*	0.7†	0.9	1.0	3.3	4.1	9.1	19.3
Albany	0.8*	0.0	1.2†	1.2	1.8	5.6	8.0	18.6	17.4
Elizabeth	0.9	0.0	0.5	0.9	1.6	2.4	3.3	8.0	16.6
Syracuse	1.0*	0.0	0.3*	0.8	2.3	7.7	12.3	15.6	
Trenton	2.4*	0.0	1.4†	1.1	2.1	8.2	8.6	22.3	28.1

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

applied to all data for the quinquennium 1936-1940. Another symbol has been used to indicate those cities in which more than one third of the reported deaths were stated to have been among nonresidents.

A comparison of deaths reported by the New England health officers shows a consistency in the annual returns made during each of the past five years and the retabulation submitted for this inquiry. There were reported in 1936 eleven deaths, in 1937 twelve, in 1938 twelve, in 1939 six, in 1940 nine, a total of fifty for the quinquennial period. Ten New England cities (Cambridge, Fall River, Hartford, Lowell, Lynn, New Bedford, New Haven, Springfield, Waterbury, Worcester) report no death from typhoid in 1940 (table 1). In 1939 there were eleven such cities. Fall River, Lynn and New Bedford record no death in four years; Cambridge and Lowell extend their record to three years. Hartford, Springfield, Waterbury and Worcester report no death in two years. Of eighteen cities among the ninety-three in the United States recording no deaths from typhoid during the past two years, nine, or one half of the total, are in the New England group. Springfield reports no death among residents during the past six years, Worcester none for five years. While it was stated in the review for 1939 that Bridgeport reported

TABLE 3.—*Death Rates of Ten Cities in South Atlantic States from Typhoid per Hundred Thousand of Population*

	1940	1939	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Wilmington	0.0	0.0	0.5	1.5	3.1	4.7	25.8#	23.2#	33.0
Charlotte	0.0	0.0	1.6†	2.5	...	...	....	....	....
Tampa	0.0	0.9	0.6†	3.4	3.8	19.1	43.9#	....	....
Jacksonville	0.0	1.8	2.3	1.6	4.4	....	....	....	....
Baltimore	0.3†	0.6†	0.9†	1.4	3.2	4.0	11.8	23.7	35.1
Washington	0.6	0.6	1.1	2.2	2.8	5.4	9.5	17.2	36.7
Atlanta	0.7*	2.3	2.1†	7.3	11.1	14.5	14.2	31.4	58.4
Miami	1.2	1.2	2.4	2.0	3.5	...	...	....	....
Richmond	2.6	1.6	2.5†	2.4	1.9	5.7	9.7	15.7	34.0
Norfolk	2.8†	0.0	1.1†	3.3	2.2	2.8	8.8	21.7	42.1

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

The preceding articles in this series were published in THE JOURNAL May 31, 1913, p. 1702; May 9, 1914, p. 1473; May 17, 1915, p. 1322; April 22, 1916, p. 1305; March 17, 1917, p. 845; March 16, 1918, p. 777; April 5, 1919, p. 997; March 6, 1920, p. 672; March 26, 1921, p. 860; March 25, 1922, p. 890; March 10, 1923, p. 691; Feb. 2, 1924, p. 389; March 14, 1925, p. 813; March 27, 1926, p. 948; April 9, 1927, p. 1148; May 19, 1928, p. 1624; May 18, 1929, p. 1674; May 17, 1930, p. 1574; May 9, 1931, p. 1576; April 30, 1932, p. 1550; May 13, 1933, p. 1491; May 19, 1934, p. 1677; June 8, 1935, p. 2093; June 6, 1936, p. 1983; June 19, 1937, p. 2118; July 30, 1938, p. 414; May 13, 1939, p. 1941, and May 25, 1940, p. 2103.

no death in six years, in light of more recent reports from the health officer Bridgeport had no death in five years (1935 to 1939). In 1940 there were three deaths in Bridgeport, all among residents. It is stated that a carrier was the source of infection for one death; the other two were traced to the eating of clams dug from polluted waters close to shore. Boston records one death among nonresidents. Of thirteen deaths during the past five years (1936-1940) only three have been among residents. For the quinquennium 1931-1935 New Haven reports but one death among residents; for the five years 1936-1940 there are six such deaths recorded. While Providence reports but seven deaths (all among residents) for the last five years, three of these deaths occurred in 1940. Likewise, of three deaths during the last quinquennium in Somerville, two are recorded for 1940. The New England cities as a whole (population 2,579,152) have lost first place among the grouped cities (table 13). The group of Middle Atlantic cities has moved from second to first place, the group of Mountain and Pacific cities occupies second place for 1940 and the New England and East North Central

TABLE 4.—*Death Rates of Nineteen Cities in East North Central States from Typhoid per Hundred Thousand of Population*

	1940	1939	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
South Bend	0.0	0.0	0.0	0.8	...	...	...	....	....
Fort Wayne	0.0	0.0	0.0	2.1	4.2	12.9	7.3	....	....
Milwaukee	0.0	0.0	0.1	0.2	0.8	1.6	6.5	13.6	27.0
Grand Rapids	0.0	0.6	0.5†	0.2	1.0	1.9	9.1	25.5	29.7
Canton	0.0	0.9*	0.4†	0.8	1.4	3.3	8.9	....	....
Youngstown	0.0	1.2	0.7	1.2	1.1	7.2	19.2	29.5	35.1
Peoria	0.0	1.9	1.3†	0.9	0.2	3.7	5.7	16.4	15.7#
Chicago	0.1	0.3	0.3	0.4	0.6	1.4	2.4	8.2	15.8
Columbus	0.3*	1.0†	1.4†	1.9	2.1	3.5	7.1	15.8	40.0
Detroit	0.3	0.5	0.4	0.7	1.3	4.1	8.1	15.4	22.8
Akron	0.4*	0.0	0.6†	0.9	1.5	2.4	10.6	21.0	27.7#
Toledo	0.4	0.4*	1.0†	1.2	3.0	5.8	10.6	31.4	37.5
Flint	0.7	0.0	1.3†	0.8	1.6	4.6	22.7	18.8	46.9
Cleveland	0.7	0.6†	0.6	1.1	1.0	2.0	4.0	10.0	15.7
Cincinnati	0.7†	1.1†	1.1†	1.4	2.5	3.2	3.4	7.8	30.1
Gary	0.9	1.8	1.1	0.8	...	...	...	....	....
Evansville	1.0*	1.0*	1.2†	1.8	6.2	5.0	17.5	32.0	35.0
Indianapolis	1.0	1.8†	1.2†	1.8	2.7	4.6	10.3	20.5	30.4
Dayton	2.8	0.0	1.4	0.8	1.9	3.3	9.3	14.8	22.5

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

cities tie for third place. For the quinquennial average (1936-1940) the New England group continues to hold first place.

The health officers of the Middle Atlantic cities have not proved as consistent in the reporting of typhoid deaths. On the basis of their annual returns for each of the past five years they report a total of two hundred and eighty-eight deaths, while in the present retabulation they record but two hundred and eighty-three deaths for the quinquennium 1936-1940. The first place Middle Atlantic cities (table 2) have a group rate (0.27) which is lower than that of 1939 (0.37) and 1938 (0.44). Nine cities (Buffalo, Camden, Erie, Newark, Reading, Rochester, Scranton, Utica, Yonkers) report no typhoid death in 1940. In three cities (Albany, Syracuse, Trenton) it is stated that all deaths were among nonresidents. While Utica records no death among residents during the past ten years, it is stated that one death occurred among nonresidents in each of the two years 1935 and 1939. The health officer failed to record such nonresident death in the 1939 report. Yonkers is the only city in this group to report no death for two years. Camden records no death among residents for three years, Albany for two. Buffalo reports but four typhoid deaths for the quinquennium 1936-1940, three among residents. Erie also records four deaths during these five years, only one of which was among residents. New York reports eleven deaths, all among residents. For the 1939 review the health officer reported twenty-two deaths, but in the present survey the 1939 number has been reduced to seventeen, fifteen among residents. It is stated that in the former review the deaths from paratyphoid were inadvertently included. As in other cities in the North, New York

TABLE 5.—*Death Rates of Six Cities in East South Central States from Typhoid per Hundred Thousand of Population*

	1940	1939	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Louisville	0.9†	0.9*	0.9	2.8	3.7	4.9	9.7	19.7	52.7
Chattanooga	1.6	0.0	0.9	5.8	8.0	18.6	27.2	35.8#	....
Memphis	1.7†	5.9†	4.0†	7.5	9.3	18.9	27.7	42.5	35.3
Knoxville	1.8	4.5	3.8	6.0	10.7	20.8	25.3#	....	....
Birmingham	3.4†	1.1†	2.5†	4.1	8.0	10.8	31.5	41.3	41.7
Nashville	3.6†	3.0†	3.4†	5.7	18.2	17.8	20.7	40.2	61.2

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

does not have an organized campaign of immunization, although such preventive treatments are advised for residents who visit camps or summer resorts where typhoid may be endemic and in families where a case exists or a carrier is discovered. In the 1939 review Paterson was included with the eight cities reporting no death. The health officer now reports one death for 1939 among nonresidents, for 1940 one death among residents. In 1939 Philadelphia reported twelve deaths, only six of which were among residents. For 1940 there are recorded twelve deaths, all but one among residents. During the last five years there were eighty-two deaths from typhoid in Philadelphia, of which seventy-three are stated to be among residents. Pittsburgh reports three deaths, all among residents. Rochester reports no death from typhoid, notwithstanding a contamination of a portion of the city water supply in December, at which time about twenty thousand inoculations were given by the health bureau. Syracuse records three deaths (all among nonresidents) during the past five years. In the group as a whole (population 13,129,185) there were thirty-six deaths in 1940, compared with forty-eight in the preceding year.

TABLE 6.—*Death Rates of Nine Cities in West North Central States from Typhoid per Hundred Thousand of Population*

	1940	1939	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Duluth	0.0	0.0	0.2	1.0	1.1	1.7	4.4	19.8	45.5
St. Paul	0.0	0.0	0.3	0.7	1.4	3.4	5.1	9.2	12.8
Wichita	0.0	0.0	0.4	1.1	1.2	6.3	...	....	....
Des Moines	0.0	1.3	1.3	2.5	2.4	2.2	6.4	15.9	23.7
Minneapolis	0.4	0.2	0.2	0.8	0.8	1.9	5.0	10.6	32.1
Omaha	0.4	0.4	0.6	0.9	1.3	3.3	5.7	14.9	40.7
St. Louis	0.4†	0.7†	0.7	1.6	2.1	3.9	6.5	12.1	14.7
Kansas City, Mo.	0.7†	1.0	0.9†	1.6	2.8	5.7	10.6	16.2	35.6
Kansas City, Kan.	1.6	0.0	1.0	1.0	1.7	5.0	9.4	31.1	74.5#

† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

For the nine cities of the South Atlantic states (table 3) which have been included in previous reviews, the local health officers now report one hundred and eighty-two deaths instead of one hundred and eighty-four for the five years 1936-1940. The rate (0.73) is significantly lower than that of 1939 (0.93). Charlotte has been included in the group for the first time; however, for purposes of adequate comparison the figures for this city have been omitted in calculating rates for the group as a whole. Four of the ten cities (Charlotte, Jackson-

ville, Tampa, Wilmington) record no death in 1940. Charlotte and Wilmington report no death for two years. With seven deaths in 1939, Atlanta reports but two in 1940, both among nonresidents. It is stated that of three deaths in Baltimore two were among nonresidents, and of thirty-nine deaths occurring in this city during the five years 1936-1940 fourteen were thus classified. Charlotte, a newcomer among the cities of 100,000 population, records eight deaths for the quinquennium, five or which were among residents. Of five deaths in Richmond in 1940, four were among residents; of four in Washington, three were thus classified. In the nine cities (exclusive of Charlotte) there occurred twenty deaths in 1940, twenty-five in 1939, forty-eight in 1938.

TABLE 7.—*Death Rates of Eight Cities in West South Central States from Typhoid per Hundred Thousand of Population*

	1940	1939	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Tulsa	0.0	1.4	0.4	1.1	8.3	16.3#	....	....	....
Oklahoma City	1.0	3.0	2.6	4.3	7.4#	....	....	....	....
Fort Worth	1.1	0.6*	2.1	4.5	5.9	6.1	16.3#	11.9	27.8
Houston	1.6	1.6†	2.3	3.2	4.8	7.6	14.2	38.1	49.5#
New Orleans	2.4†	7.3†	5.0†	9.6	9.9	11.6	17.5	20.9	35.6
San Antonio	2.7	2.4†	2.9	4.3	4.6	9.3	23.3	29.5	35.9
Dallas	3.0†	1.7*	2.7†	5.1	7.3	11.2	17.2	....	....
El Paso	3.1†	6.2*	4.5	5.2	9.1	10.8	30.7	42.8	....

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

To the eighteen cities (population 9,386,378) previously included in the East North Central group (table 4) has been added Gary, but again the figures for this city have been omitted in the tables for group comparison. For the eighteen cities the health officers report two hundred and forty-five deaths for the five year period 1936-1940, two more than recorded in the previous annual tabulations. It is now stated that in these eighteen cities there were sixty-nine deaths in 1936, sixty-four in 1937, thirty-four in 1938, forty-five in 1939, thirty-three in 1940. The rate for 1940 (0.35) is lower than that of 1939 (0.48) and equal to the rate for the New England cities. There are seven cities (Canton, Fort Wayne, Grand Rapids, Milwaukee, Peoria, South Bend, Youngstown) which report no death in 1940. Fort Wayne reports no typhoid death in six years, South Bend no death in five years, Milwaukee no death in four years. In three cities (Akron, Columbus, Evansville) it is stated that all deaths were among nonresidents. Of eight deaths in Akron during the past five years, five were among nonresidents; of two in Canton, one was so classified. Chicago reports only four deaths, all among residents. Of forty-three deaths in Chicago during the period 1936-1940, all but one were among residents. The Chicago figures do not include the deaths of Illinois residents outside Chicago and may not, therefore, be directly comparable with those of other cities. Cincinnati reports three deaths in 1940, two among residents; Cleveland six, five among residents. Of twenty-two deaths in Columbus during the quinquennium 1936-1940, twelve were among nonresidents. Of ten in Dayton, five were among nonresidents. For 1940 Dayton records six deaths, five among residents; Detroit five, all among residents. Seventeen cases of typhoid in Dayton were traced to a carrier who prepared food for a banquet held in April; later 2 other cases were traced to this same carrier. It is stated that of six deaths from typhoid in Evansville during the past five years, five were among nonresidents; of twenty-four in Indianapolis, eleven were among nonresidents; of fourteen in Toledo, six were among nonresidents.

TABLE 8.—*Death Rates of Twelve Cities in Mountain and Pacific States from Typhoid per Hundred Thousand of Population*

	1940	1939	1936-1940	1931-1935	1926-1930	1921-1925	1916-1920	1911-1915	1906-1910
Seattle	0.0	0.3	0.2	0.7	2.2	2.6	2.9	5.7	25.2
Portland	0.0	0.3	0.3	0.8	2.3	3.5	4.5	10.8	23.2
Sacramento	0.0	0.9*	1.5*	6.3	...	...	...	....	....
San Diego	0.0	1.0*	0.8	1.3	1.0	1.6	7.9	17.0	10.8
Denver	0.0	1.3	1.4	1.7	2.6	5.1	5.8	12.0	37.5
Spokane	0.0	2.5†	1.2	1.0	2.2	4.4	4.9	17.1	50.3
San Francisco	0.3†	0.0	0.4	0.8	2.0	2.8	4.6	13.6	26.3
Los Angeles	0.4†	0.3	0.7†	0.8	1.5	3.0	3.6	10.7	19.0
Oakland	0.6*	0.3	0.5†	1.2	1.2	2.0	3.8	8.7	21.5
Long Beach	0.6	0.6	0.5	0.5	1.1	2.1#	...	....	....
Salt Lake City	0.7*	0.0	0.3*	0.7	1.9	6.0	9.3	13.2	41.1
Tacoma	0.9	0.9	0.5	0.9	1.8	3.7	2.9	10.4	19.0

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
# Incomplete data.

The six cities (table 5) in the East South Central group (population 1,286,747) show a decrease in the death rate (2.09 in 1940; 2.58 in 1939). The health officers now record one hundred and sixty-one deaths for the quinquennium 1936-1940, two less than recorded in the previous tabulations. For 1939 two cities (Louisville, Chattanooga) report no death among residents. While in 1940 there were no cities in this group, four (Louisville, Memphis, Birmingham, Nashville) report that more than one half of the deaths occurred among nonresidents (fifteen of twenty-three). Again the death rate in these urban centers is affected unfavorably by the hospitalization of cases brought in from the surrounding rural areas. Of nine deaths in Birmingham, it is stated that seven were in nonresidents. The proportion for 1940 is much higher than for the five year period (thirteen of thirty-four). Chattanooga, reporting no death in 1939, records two among residents in 1940; Knoxville two, one among residents; Louisville three, one among residents; Nashville, six, two among residents, one of whom contracted the infection outside the city limits. Reporting seventeen deaths in 1939, twelve among nonresidents, Memphis records but five deaths in 1940, and it is stated that two of these were among nonresidents. The rate for the six cities in 1940 (2.09) is slightly higher than that for the West South Central group (2.00).

TABLE 9.—*Eighteen Cities with No Typhoid Death in 1939 and 1940*

Cambridge ††	New Bedford †
Charlotte	South Bend **
Duluth	Springfield
Fall River †	St. Paul
Fort Wayne *	Waterbury
Hartford	Wichita †
Lowell ††	Wilmington
Lynn †	Worcester
Milwaukee †	Yonkers

* No typhoid death in six years.
** No typhoid death in five years.
† No typhoid death in four years.
†† No typhoid death in three years.

The West North Central group (table 6) (population 2,716,484) shows a decrease in the death rate from 0.52 in 1939 to 0.41 in 1940. For the five years 1936-1940 the health officers record eighty-one deaths, an increase of two over the total reported in the statistics previously submitted for each of the five years. Originally reporting one death in 1938, Des Moines now records three deaths for that year. The rate for

the nine cities (0.41) approximates that (0.35) for the New England and the East North Central groups. Four cities (Des Moines, Duluth, St. Paul, Wichita) record no death in 1940. Wichita reports no death during the past four years, Duluth but one death during the quinquennium 1936-1940. Kansas City, Kan., with no death in either 1938 or 1939, reports two among residents in 1940. It is stated that in Kansas City, Mo., there were three deaths in 1940, two among residents; for the quinquennium, eighteen, eleven among residents. Minneapolis reports two deaths in 1940, both in residents; four for the five years 1936-1940, three among residents. St. Louis records three deaths, two among residents.

The cities in the West South Central group (table 7) (population 2,048,692) report a very significant reduction in the typhoid rate (3.35 in 1939, 2.00 in 1940). The number of reported deaths dropped from sixty-eight in 1939 to forty-one in 1940. A comparison of deaths reported by the health officers in this group of cities shows a similarity between returns made during each of the five years and the retabulation submitted for this inquiry. There were reported in 1936 seventy-nine deaths, in 1937 forty-nine, in 1938 seventy-four, in 1939 sixty-eight, in 1940 forty-one, a total of three hundred and eleven for the quinquennial period. Tulsa records no death in 1940. In 1939 there was no city without a death, although three (Dallas, El Paso, Fort Worth) reported that all deaths were in nonresidents. It is stated that of nine deaths in Dallas in 1940 six were among nonresidents. Houston records six deaths with no attempt to differentiate between resident and nonresident. Of twelve deaths in New Orleans, seven were among nonresidents. San Antonio reports seven deaths, five among residents.

To the eleven cities (population 4,186,039) previously included in the Mountain and Pacific group (table 8) has been added Sacramento, but the figures for this city have been omitted in the tables for group comparison. For the eleven cities the health officers report one hundred and twenty-three deaths for the five year period 1936-1940, six more than recorded in the previous annual tabulations. It is now stated that in these eleven cities there were thirty-four deaths in 1936, thirty-three in 1937, twenty-three in 1938, twenty in 1939, thirteen in 1940. The rate for 1940 (0.30) is lower than that of 1939 (0.48). The group of Mountain and Pacific cities occupies second place for 1940. While in 1938 there were five cities with no death, there were but two such cities in 1939. In 1940 five cities (Denver, Portland, San Diego, Seattle, Spokane) among the original eleven record no death, and two additional cities (Oakland, Salt Lake City) report all deaths among nonresidents. Sacramento like-

TABLE 10.—*Death Rates from Typhoid in 1940*

Honor Roll: No Typhoid Deaths (Forty-One Cities)¶

Buffalo	Lowell	South Bend
Cambridge	Lynn	Spokane
Camden	Milwaukee	Springfield
Canton	Newark	St. Paul
Charlotte	New Bedford	Tampa
Denver	New Haven	Tulsa
Des Moines	Peoria	Utica
Duluth	Portland	Waterbury
Erie	Reading	Wichita
Fall River	Rochester	Wilmington
Fort Wayne	Sacramento	Worcester
Grand Rapids	San Diego	Yonkers
Hartford	Scranton	Youngstown
Jacksonville	Seattle	

First Rank: From 0.1 to 1.9 Deaths per Hundred Thousand (Forty-Three Cities)‖

Boston..... 0.1*	Long Beach..... 0.6	Gary..... 0.9
Chicago..... 0.1	Philadelphia..... 0.6	Tacoma..... 0.9
New York..... 0.1	Washington..... 0.6	Evansville..... 1.0*
Columbus..... 0.3*	Atlanta..... 0.7*	Syracuse..... 1.0*
Baltimore..... 0.3†	Salt Lake City.... 0.7*	Indianapolis..... 1.0
San Francisco..... 0.3†	Cincinnati..... 0.7†	Oklahoma City.... 1.0
Detroit..... 0.3	Jersey City..... 0.7†	Fort Worth..... 1.1
Akron..... 0.4*	Kansas City, Mo.. 0.7†	Miami..... 1.2
Los Angeles..... 0.4†	Cleveland..... 0.7	Providence..... 1.2
St. Louis..... 0.4†	Flint..... 0.7	Chattanooga..... 1.6
Minneapolis..... 0.4	Paterson..... 0.7	Houston..... 1.6
Omaha..... 0.4	Albany..... 0.8*	Kansas City, Kan. 1.6
Pittsburgh..... 0.4	Louisville..... 0.9†	Memphis..... 1.7†
Toledo..... 0.4	Elizabeth..... 0.9	Knoxville..... 1.8
Oakland..... 0.6*		

Second Rank: From 2.0 to 4.9 (Twelve Cities)

Bridgeport..... 2.0	Richmond..... 2.6	Dallas..... 3.0†
Somerville..... 2.0	San Antonio..... 2.7	El Paso..... 3.1†
Trenton..... 2.4*	Norfolk..... 2.8†	Birmingham..... 3.4†
New Orleans..... 2.4†	Dayton..... 2.8	Nashville..... 3.6†

* All typhoid deaths were stated to be in nonresidents.
† One third or more of the reported typhoid deaths were stated to be in nonresidents.
¶Thirty-nine without Charlotte and Sacramento.
‖ Forty-two without Gary.

TABLE 11.—*Number of Cities with Various Typhoid Death Rates*

	No. of Cities	10.0 and Over	5.0 to 9.9	2.0 to 4.9	1.0 to 1.9	0.1 to 0.9	0.0
1906-1910	77	75	2	0	0	0	0
1911-1915	79	58	19	2	0	0	0
1916-1920	84	22	32	30	0	0	0
1921-1925	89	12	17	48	12	0	0
1926-1930	92	3	10	30	37	12	0
1931-1935	93	0	6	17	28	42	0
1930	93	2	6	30	23	22	10
1931	93	2	6	23	28	22	12
1932	93	1	7	13	29	29	14
1933	93	0	7	18	19	33	16
1934	93	0	9	11	27	23	23
1935	93	0	7	15	18	29	24
1936	93	0	3	15	21	36	18
1937	93	0	1	13	26	26	27
1938	93	0	3	13	14	34	29
1939	93	0	3	7	17	32	34
1940*	93	0	0	12	12	30	39

* Charlotte, Gary and Sacramento omitted.

TABLE 12.—*Total Typhoid Rate for Seventy-Eight Cities, 1910-1940* *

	Population	Typhoid Deaths	Typhoid Death Rate per 100,000
1910	22,573,435	4,637	20.54
1911	23,211,341	3,950	17.02
1912	23,835,399	3,132	13.14
1913	24,457,989	3,285	13.43
1914	25,091,112	2,781	11.08
1915	25,713,346	2,434	9.47
1916	26,257,550	2,191	8.34
1917	26,865,408	2,016	7.50
1918	27,086,696†	1,824†	6.73
1919	27,735,083†	1,151†	4.15
1920	28,244,878	1,088	3.85
1921	28,859,062	1,141	3.95
1922	29,473,246	963	3.26
1923	30,087,430	950	3.16
1924	30,701,614	943	3.07
1925	31,315,598	1,079	3.44
1926	31,929,782	907	2.84
1927	32,543,966	648	1.99
1928	33,158,150	628	1.89
1929	33,772,334	537	1.59
1930	34,410,235	554	1.61
1931	34,508,750	563	1.63
1932	34,607,505	442	1.28
1933	34,708,945	423	1.22
1934	34,833,650	413	1.19
1935	35,005,351	348	0.99
1936	35,196,325	337	0.96
1937	35,386,380	289	0.82
1938	35,578,011	257	0.72
1939	35,767,022	232	0.65
1940	35,895,638	172	0.48
Rates for Ninety-Three Cities:			
1935	37,025,179	385	1.04
1936	37,241,414	366	0.98
1937	37,459,339	324	0.86
1938	37,680,155	298	0.79
1939	37,900,354	259	0.68
1940	38,060,662	190	0.50

* The following fifteen cities are omitted from this table because data for the full period are not available: Canton, Chattanooga, Dallas, Fort Wayne, Jacksonville, Knoxville, Long Beach, Miami, Oklahoma City, South Bend, Tampa, Tulsa, Utica, Wichita, Wilmington.
† Data for Fort Worth lacking.

wise reports no death in 1940. It is stated that in Denver there were twenty-three deaths during the four year period 1936-1939 but no death in 1940. Los Angeles records six deaths, three among residents; forty-nine for the quinquennium 1936-1940, twenty-six among residents. Sacramento records eight deaths for the five years, all among nonresidents. During the past eleven years (1930-1940) there have occurred forty-three deaths in this city, and but three of these were among residents. Patients from the delta region south of the city are brought to Sacramento hospitals for treatment. San Francisco records two deaths, one in a nonresident.

THE HONOR ROLL

The number of cities with no death from typhoid has increased to forty-one. In 1936 there were but eighteen such cities, in 1937 twenty-seven, in 1938 twenty-nine, in 1939 thirty-four. In 1939 there were fourteen cities with no typhoid death for at least two years; in 1940 there were eighteen such cities (table 9). In table 10 the cities are grouped in rank. In 1938 and again in 1939 there were three cities in third rank (rate in excess of 5.0); however, in 1940 no city falls in this rank. Less impressive is the fact that in 1940 there

TABLE 13.—*Total Typhoid Death Rate per Hundred Thousand of Population for Ninety-Three Cities According to Geographic Divisions*

	Population	Typhoid Deaths 1940	Typhoid Deaths 1939	Typhoid Death Rates 1940	1939	1936-1940	1931-1935	1926-1930
New England	2,579,152	9	6	0.35	0.23	0.39	0.70	1.31
Middle Atlantic	13,129,185	36	48	0.27	0.37	0.43	0.80	1.40
South Atlantic	2,727,985	20	25	0.73	0.93	1.14	2.70	4.50
East North Central	9,386,378	33	45	0.35	0.48	0.53	0.75	1.29†
East South Central	1,286,747	27	33	2.09	2.58	2.54	4.81	8.31
West North Central	2,716,484	11	14	0.41	0.52	0.60	1.24	1.83
West South Central	2,048,692	41	68	2.00	3.35	3.09	5.36	7.32‡
Mountain and Pacific	4,186,039	13	20	0.30	0.48	0.60	0.88	1.80

† Data for South Bend for 1925-1929 are not available.
‡ Lacks data for Oklahoma City in 1926.

are twelve cities with rates in excess of 2.0, while there were but ten such cities in 1939. It should be emphasized that in Trenton all deaths were among nonresidents, and in six of the remaining cities with rates in excess of 2.0 the records indicate that one third or more of deaths were among nonresidents. Nine cities in the first rank (Boston, Columbus, Akron, Oakland, Atlanta, Salt Lake City, Albany, Evansville, Syracuse) would appear (in addition to Trenton) in the honor roll were they not charged with deaths in nonresidents. The downward trend in the rates is shown in table 11.

For the quinquennium 1936-1940 the cities of the New England States have the lowest rate (0.39), followed in order by the Middle Atlantic and East North Central groups (table 13). The West North Central and Mountain and Pacific groups have the same rate (0.60). The number of deaths from 1935 to 1940 and the corresponding rates (table 12) for the seventy-eight cities and also the ninety-three cities have been corrected in light of the new figures submitted by the health officers and the census data furnished by the Bureau of the Census. For the seventy-eight cities for which data are available since 1910 there occurred one hundred and seventy-two deaths from typhoid in 1940, which is the lowest of record (two hundred and fifty-seven in 1938; two hundred and thirty-two in 1939). The rate for all cities is now just about one half of one point per hundred thousand of population. No outbreaks have been recorded. Preventive measures have been the same as reported for previous years.

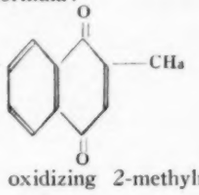
Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

AUSTIN E. SMITH, M.D., Acting Secretary.

MENADIONE (pronounced mĕ-nä-dī-one).—2-methyl-1, 4-naphthoquinone.—$C_{11}H_8O_2$ (M. W. 172.17). Menadione has the following structural formula:



It may be prepared by oxidizing 2-methylnaphthalene with chromic acid.

Actions and Uses.—A synthetic naphthoquinone derivative having physiologic properties of vitamin K. See the general article vitamin K, New and Nonofficial Remedies, 1941, p. 546.

Dosage.—From 1 to 2 mg. daily. The dose should not exceed 2 mg. a day and should not be continued at 2 mg. a day for a period exceeding four weeks. When the preparation is given orally, bile salts should be administered with menadione in cases of prothrombin deficiency due to bile obstruction.

Menadione occurs as a lemon-yellow, crystalline powder with a faint, somewhat musty odor. Under the polarizing microscope it appears as rod-shaped, birefringent crystals, exhibiting oblique extinction. Menadione, especially when in solution, is sensitive to light and should be stored in the dark. It is very soluble in chloroform, soluble in acetone, benzene and ether, slightly soluble in petroleum ether and ethyl alcohol, sparingly soluble in methanol and very slightly soluble in water. The melting point of menadione is from 105 to 107 C. Grind together equal portions of menadione and phenacetin (M. P. 134-135 C.): the main portion of the resulting mixture melts sharply at 95 C. (eutectic melting point).

Dissolve a few crystals of menadione in 5 cc. of alcohol, add 2 cc. of an alcohol ammonia solution prepared by mixing equal parts of alcohol and concentrated ammonium hydroxide; shake and add two drops of ethyl cyanoacetate: a purple color develops. Add 2 cc. of six-normal potassium hydroxide solution: the color slowly changes from purple to green to yellow. (This color is also produced by the corresponding 2-methyl-1, 4-naphthohydroquinone and by certain other derivatives).

Prepare the 2,4-dinitrophenylhydrazone of menadione: add a saturated solution of 2,4-dinitrophenylhydrazine in two-normal hydrochloric acid to a solution of menadione in ethanol, warm at 60 to 70 C. for ten minutes, cool and filter; redissolve the residue in hot chloroform, filter and allow the solution to cool slowly: bright orange needles and groups of needles form which sublime above 200 C. and melt with decomposition at 299 C.

Ash 0.1 Gm. of menadione and fuse the residue with a mixture of sodium and potassium carbonates and sodium peroxide. Dissolve the cooled melt in an excess of dilute sulfuric acid, add three drops of diphenyl carbazide reagent (a 0.2 per cent solution of diphenyl carbazide in a mixture of one part of glacial acetic acid and nine parts of alcohol) and dilute to 10 cc.: the color produced is not greater than that of a standard made by adding three drops of the reagent to a solution containing 0.0283 mg. of potassium dichromate in 10 cc. of water previously acidified with dilute sulfuric acid.

Dry an accurately weighed sample of menadione for eight hours over anhydrous calcium sulfate or phosphorus pentoxide: the loss in weight does not exceed 0.2 per cent. Determine the carbon and hydrogen content of a dried sample of menadione: the percentage of carbon is not less than 76.4 nor more than 76.8; the percentage of hydrogen is not less than 4.5 nor more than 4.9. The residue from the carbon hydrogen combustion or from a separate ash determination does not exceed 0.05 per cent.

Dissolve approximately 0.1 Gm. of menadione in 15 cc. of glacial acetic acid contained in a 100 cc. flask equipped with a standard ground glass joint. Add 5 cc. of water, approximately 0.2 Gm. of powdered zinc and boil under reflux for exactly ten minutes. Cool and filter through a fritted glass automatic siphon apparatus, similar to that employed for micro halogen determinations (Quantitative Organic Microanalysis by Fritz Pregl, Philadelphia, P. Blakiston's Son & Co., Inc., 1937, page 98, fig. 32). Rinse the reaction vessel several times with small portions of glacial acetic acid and filter in the same manner. Add 15 cc. of 10 per cent sulfuric acid solution and one drop of *o*-phenanthroline-ferrous complex indicator to the combined filtrates and titrate with 0.05 normal ceric sulfate. Each cubic centimeter of 0.05 normal ceric sulfate is equivalent to 4.305 mg. of menadione. The menadione content found is not less than 99.0 per cent nor more than 100.5 per cent.

LACTATE RINGER'S SOLUTION.—An aqueous solution containing in 1,000 cc. sodium chloride, NaCl, U. S. P., 6.0 Gm.; potassium chloride, KCl, N. F., 0.30 Gm.; calcium chloride, $CaCl_2.2H_2O$, U. S. P., 0.20 Gm., and sodium lactate, $NaC_3H_5O_3$, 3.1 Gm. The sodium lactate is prepared by neutralizing lactic acid U. S. P. with a solution of sodium hydroxide U. S. P. Certain modifications of this formula have been used, which include the addition of 0.2 Gm. of magnesium

chloride and/or 0.3 Gm. of sodium bicarbonate per thousand cubic centimeters. Lactate Ringer's solution containing either of these ingredients is labeled accordingly.

Actions and Uses.—Lactate Ringer's Solution has essentially the same use as physiologic solution of sodium chloride, and more particularly Ringer's solution. As is the case with the other salt solutions, it is approximately isotonic with body fluids and may be accompanied with various percentages of dextrose for the purpose of supplying nourishment by vein. Lactate Ringer's Solution is designed primarily for supplying the mineral needs of the body and for the purpose of maintaining or helping to maintain buffer balances.

Dosage.—Same as for Ringer's solution (N. N. R. 1941, p. 389).

Lactate Ringer's solution occurs as a clear, colorless, odorless solution, possessing a slightly saline taste. The specific gravity is from 1.006 to 1.007 at 25 C., and the *p*H is not below 5.0 nor above 7.5. Twenty-five cc. of the solution concentrated to 10 cc. conforms to the U. S. P. XI test for heavy metals.

Transfer 1 cc. of lactate Ringer's solution, drop by drop, to 4 cc. of sulfuric acid contained in a test tube and keep cool by agitation in cold water. Place the test tube and contents in the steam bath for two minutes; remove the test tube and cool the contents well; add cautiously 1 cc. of a saturated aqueous guaiacol solution: a rose color develops.

Evaporate a 20 cc. portion of lactate Ringer's solution in a beaker on a steam bath until it is reduced to about 5 cc. in volume. Transfer the evaporated liquid to a suitable test tube and dilute it to 9 cc. Add 1 cc. of freshly prepared sodium cobaltic nitrite solution and mix the contents thoroughly. Treat similarly, omitting the process of evaporation, in an exactly similar test tube, a 4 cc. portion of a standard aqueous solution containing 2.0 Gm. of potassium chloride (previously dried) in 1,000 cc.: the turbidity produced by the lactate Ringer's solution at the end of fifteen minutes is less than that produced by 4 cc. of the standard solution (limit of potassium).

Transfer 5 cc. of lactate Ringer's solution to a Nessler tube; add 0.5 cc. of diluted acetic acid, 40 cc. of water and 5 cc. of ammonium oxalate solution. Dilute the solution at once to 50 cc. and mix the contents thoroughly. Treat similarly portions of a standard solution formed by dissolving 0.154 Gm. of precipitated calcium carbonate (previously dried to constant weight at 200 C.) in 10 cc. of water and 3 cc. of acetic acid, diluting the solution to 250 cc.: the turbidity produced by 5 cc. of the lactate Ringer's solution at the expiration of fifteen minutes is less than that produced by 1.25 cc. and more than that produced by 1 cc. of the standard solution (limit of calcium).

Transfer 25 cc. of lactate Ringer's solution to a drying dish, evaporate to dryness on the steam bath and dry the residue to constant weight at 150 C.: the weight of residue obtained is not less than 0.245 nor more than 0.270 Gm. Evaporate a 25 cc. portion of lactate Ringer's solution to dryness, treat the residue cautiously with an excess of sulfuric acid and ignite the residue to constant weight at 750 C.: the weight of ash obtained is not less than 0.245 Gm. nor more than 0.270 Gm.

Transfer 10 cc. of lactate Ringer's solution to a 400 cc. beaker, add 50 cc. of water and 4 cc. of diluted nitric acid; dilute the solution to 200 cc., add 15 cc. of silver nitrate solution; heat the mixture to boiling and allow to cool and stand until the precipitate is granular. Filter the precipitate on a prepared Gooch crucible; wash the precipitate well with hot water; dry it to constant weight at 140-150 C.: the chloride calculated from the silver chloride weighed is not less than 0.378 Gm. nor more than 0.405 Gm. per hundred cubic centimeters of lactate Ringer's solution.

Transfer 25 cc. of a potassium dichromate solution (7.6237 Gm. of $K_2Cr_2O_7$ per liter) to a 500 cc. Erlenmeyer flask, add 20 cc. of lactate Ringer's solution and 60 cc. of an aqueous solution of sulfuric acid (40% H_2SO_4). Place the flask and contents in a water bath at 70 C.; stopper the flask when the solution attains the temperature of water bath, and keep the flask and contents in the water bath for one hour. Cool the solution, add 200 cc. of water and 8 cc. of potassium iodide solution (10% KI), stopper the flask and mix the contents well; allow the solution to stand for ten minutes in a dark place, and titrate the liberated iodine with tenth-normal sodium thiosulfate, using starch test solution as indicator. Make a blank test at the same time with the same quantities of reagents and correct the assay accordingly. Each cubic centimeter of dichromate solution corresponds to 0.003501 Gm. of $CH_3CHOHCOOH$. The amount of dichromate solution consumed corresponds to not less than 0.233 Gm. nor more than 0.265 Gm. of lactic acid ($CH_3CHOH\ COOH$), and to not less than 0.290 Gm. nor more than 0.330 Gm. of sodium lactate ($CH_3CHOHCOONa$) per hundred cubic centimeters of lactate Ringer's solution.

Lactate-Ringer's Solution in Vacoliter Container: Each hundred cubic centimeters contains sodium lactate ($NaC_3H_5O_3$) 0.31 Gm., sodium chloride U. S. P. 0.6 Gm., potassium chloride N. F. 0.03 Gm. and calcium chloride U. S. P. 0.02 Gm. Marketed in bottles (Vacoliter containers) of 500 cc. and 1,000 cc.

Prepared by Baxter Laboratories, Inc., Glenview, Ill., and Don Baxter, Inc., Glendale, Calif.

PURIFIED SOLUTION OF LIVER-10 U. S. P. UNITS PER CC.-MERRELL.—A sterile aqueous, clear, dark brown solution containing all of the fraction G of the liver extract (Cohn), preserved with 0.5 per cent of phenol. The daily parenteral administration of 0.1 cc. has been found to produce the standard reticulocyte response defined as 1 U. S. P. unit (injectable) when assayed in cases of pernicious anemia as required by the Council.

Actions and Uses.—Purified Solution of Liver-Merrell is recommended for intramuscular use in the treatment of pernicious anemia. See the general article Liver and Stomach Preparations (New and Nonofficial Remedies, 1941, p. 328).

Dosage.—For the average case in relapse, 10 U. S. P. injectable units (1 cc.) may be injected as the initial dose. Subsequent doses from 5 to 10 U. S. P. injectable units (0.5 to 1.0 cc.) may be given weekly until the blood picture has returned to normal. The maintenance dose should be not less than 1 U. S. P. injectable unit (0.1 cc.) daily and should be adjusted to the needs of the individual patient depending on the degree of complications. It may be administered at weekly or longer intervals in equivalent cumulative doses (15 U. S. P. injectable units twice a month).

Distributed by Wm. S. Merrell Co., Cincinnati.

Vials Purified Solution of Liver-Merrell (10 U. S. P. injectable units per cc.) 5 cc.

Purified Solution of Liver-Merrell, 10 units per cubic centimeter, is prepared as follows: Fresh edible liver is extracted with water at 170 F. for thirty minutes and filtered. The filtrate is concentrated in vacuo and extracted with 70 per cent alcohol; the alcoholic extracts are concentrated in vacuo and precipitated with ammonium sulfate. The precipitate is further purified by alcoholic fractionation, the alcohol removed and the extract made up to volume so that each cubic centimeter contains the extract from 100 Gm. of fresh liver. Five-tenths per cent phenol is used as a preservative.

PURIFIED SOLUTION OF LIVER-5 U. S. P. UNITS PER CC.-MERRELL.—A sterile aqueous, clear, dark brown solution containing all of the fraction G of the liver extract (Cohn), preserved with 0.5 per cent of phenol. The daily parenteral administration of 0.2 cc. has been found to produce the standard reticulocyte response defined as 1 U. S. P. unit (injectable) when assayed in cases of pernicious anemia as required by the Council.

Actions and Uses.—Purified Solution of Liver-Merrell is recommended for intramuscular use in the treatment of pernicious anemia. See the general article Liver and Stomach Preparations (New and Nonofficial Remedies, 1941, p. 328).

Dosage.—For the average case in relapse, 10 U. S. P. injectable units (2 cc.) may be injected as the initial dose. Subsequent doses from 5 to 10 U. S. P. injectable units (1 to 2 cc.) may be given weekly until the blood picture has returned to normal. The maintenance dose should be not less than 1 U. S. P. injectable unit (0.2 cc.) daily and should be adjusted to the needs of the individual patient depending on the degree of complications. It may be administered at weekly or longer intervals in equivalent cumulative doses (15 U. S. P. injectable units twice a month).

Distributed by Wm. S. Merrell Co., Cincinnati.

Vials Purified Solution of Liver-Merrell (5 U. S. P. injectable units per cc.) 10 cc.

Purified Solution of Liver-Merrell, 5 units per cubic centimeter, is prepared as follows: Fresh edible liver is extracted with water at 170 F. for thirty minutes and filtered. The filtrate is concentrated in vacuo and extracted with 70 per cent alcohol; the alcoholic extracts are concentrated in vacuo and precipitated with ammonium sulfate. The precipitate is further purified by alcoholic fractionation, the alcohol removed and the extract made up to volume so that each cubic centimeter contains the extract from 50 Gm. of fresh liver. Five-tenths per cent phenol is used as a preservative.

DEXTROSE (See New and Nonofficial Remedies, 1941, p. 179).

Baxter Laboratories, Inc., Glenview, Ill., and Don Baxter, Inc., Glendale, Calif. (American Hospital Supply Corporation, Chicago, eastern distributor).

Dextrose 5% W/V in Ringer's Solution in Vacoliter Container: Each hundred cubic centimeters contains dextrose U. S. P. 5 Gm., sodium chloride U. S. P. 0.7 Gm., potassium chloride N. F. 0.03 Gm. and calcium chloride U. S. P. 0.025 Gm. Supplied in bottles (Vacoliter containers) of 500 cc. and 1,000 cc.

Dextrose 10% W/V in Ringer's Solution in Vacoliter Container: Each hundred cubic centimeters contains dextrose U. S. P. 10 Gm., sodium chloride U. S. P. 0.7 Gm., potassium chloride N. F. 0.03 Gm. and calcium chloride U. S. P. 0.025 Gm. Supplied in bottles (Vacoliter containers) of 500 cc. and 1,000 cc.

Baxter Laboratories, Inc., Glenview, Ill. (American Hospital Supply Corporation, Chicago, eastern distributor).

Dextrose 5% W/V in Lactate-Ringer's Solution in Vacoliter Container: Each hundred cubic centimeters contains dextrose U. S. P. 5 Gm., sodium lactate ($NaC_3H_5O_3$) 0.31 Gm., sodium chloride U. S. P. 0.6 Gm., potassium chloride N. F. 0.03 Gm. and calcium chloride U. S. P. 0.02 Gm. Marketed in bottles (Vacoliter containers) of 500 cc. and 1,000 cc.

Dextrose 10% W/V in Lactate-Ringer's Solution in Vacoliter Container: Each hundred cubic centimeters contains dextrose U. S. P. 10 Gm., sodium lactate ($NaC_3H_5O_3$) 0.31 Gm., sodium chloride U. S. P. 0.6 Gm., potassium chloride N. F. 0.03 Gm. and calcium chloride U. S. P. 0.02 Gm. Marketed in bottles (Vacoliter containers) of 500 cc. and 1,000 cc.

SOLUTION OF EPINEPHRINE HYDROCHLORIDE-U. S. P. (See New and Nonofficial Remedies, 1941, p. 254).

SOLUTION EPINEPHRINE HYDROCHLORIDE 1:1,000-ENDO.—A brand of solution epinephrine hydrochloride-U. S. P. containing chlorobutanol 0.5 per cent and sodium bisulfate not more than 0.1 per cent, as preservative, in physiologic solution of sodium chloride.

Prepared by Endo Products Inc., Richmond Hill, N. Y.

Solution Epinephrine Hydrochloride, 1:1,000-Endo, 30 cc. vial: Marketed in vaccine stoppered vials for parenteral administration and in cork stoppered vials for topical administration.

Solution Epinephrine Hydrochloride, 1:1,000-Endo, 1 cc. ampul.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JANUARY 17, 1942

PROVISION OF MEDICAL OFFICERS FOR MILITARY SERVICES

The questionnaires published in recent issues of The Journal elicited many thousands of replies. The requirements of military necessity do not permit stating the exact numbers of names which have been furnished to the Surgeon General at this time or the number who will be requested to come immediately into the service. Appreciation is tendered particularly to the secretaries of state medical societies and to the editors of state medical journals, who gave complete cooperation in circularization of the appeal to the medical profession.

Under Medical Preparedness in this issue of The Journal appears a statement from the Procurement and Assignment Service regarding the present status of needs of the armed services and other federal agencies, and regarding also actions recently taken by the Board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians in relation to some questions that have been raised. Every physician in the United States is likely to find before the war is over that special need for his services in some capacity has arisen. The number of physicians to be called into the armed services clearly is sufficiently great to dislocate much of the present status of medical practice. One needs only to point out that the expansion of the Army by another million men would require at least seven thousand additional physicians. An army of four million men would necessitate a total of about thirty-two thousand physicians taken from civilian practice. Moreover, the call is primarily for men under 36 years of age and at most under 45 years of age. On January 15 every medical reserve officer in a governmental department or agency and physically fit was notified that he would be considered available for active duty.

The whole purpose of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians is to provide for the needs of the armed forces with the minimum amount of dislocation of medical service to civilian needs, including public health agencies, industrial plants and medical education. Another primary purpose is to place, as far as possible, men with special qualifications in duties for which they are particularly fitted. These purposes can be accomplished with the complete cooperation of the medical profession. Should the war be prolonged, however, from two to three years the majority of physicians under 45 years of age who are physically fit will be engaged in the military services. Those who are not physically fit to meet the standards of the Army and the Navy will unquestionably be called on for additional services beyond the practices in which they are now engaged. The needs of civilian defense, industry and public health must be met. The Procurement and Assignment Service plans to give to every physician who enrolls with that service for assignment a certificate and a numbered button to indicate that he has made himself available to the nation in this time of emergency. The medical profession can be depended on to do its utmost. Let us not fail!

SPEEDING PRODUCTION OF PHYSICIANS

Already several medical schools have announced the readjustment of their curriculums so that the sessions will be practically continuous, in order to speed production of physicians and possibly also to increase the total number of physicians graduating each year. For more than twenty years the medical schools of this country have accepted each year slightly over six thousand students. Each year a certain percentage of these students have been dropped from the schools because of poor scholarship or for other reasons; the total number of medical graduates has been approximately five thousand three hundred annually. More than twelve thousand graduates of colleges and some with just two or three years of college education apply each year for entrance into the medical schools. Selections are made with the greatest of care. Since a considerable percentage of those selected are still found to be unable to complete the course because of poor scholarship, many educators have been convinced that six thousand students represent all of the really well qualified candidates for the medical profession that become available. Thus the proposal to increase greatly the number of young men admitted to medical school or to modify the curriculum has caused great concern to leaders in medical education and medical practice. For more than thirty years the struggle to develop a high standard of medical education and to maintain that standard has been a difficult but a successful one. Without a doubt the standards of medical education in the United States are superior to those anywhere

else in the world. The quality of medical service available to the public of the United States is as good as can be found anywhere else in the world. No doubt, distribution of practice may be improved—but that is another question!

The Council on Medical Education and Hospitals of the American Medical Association is, of course, anxious to do everything that can be done to provide a sufficient number of well qualified physicians for the armed forces and for the civilian needs. Nevertheless, familiarity with the physical assets and faculties of the medical schools of the United States causes the Council to have some doubts as to whether every medical school in the country is capable of undertaking an increase in the number of students admitted and of embarking on a continuous session of study and yet maintaining the standards of medical education that the Council has set forth as a minimum. These considerations must not be overlooked. Perhaps the impulsive action taken by the Committee on Medical Preparedness of the Association of American Medical Colleges, presumably as a defense measure, was somewhat too sudden. Perhaps the Health and Medical Committee should have given consideration to this matter. Indeed, there does not yet appear to have been issued from the Health and Medical Committee or any other official agency any statement to the effect that it has given approval.

As one leading educator said, "I feel that those responsible have not thought the proposal through." Here are some of the difficulties that do not yet seem to have been solved:

1. If the young men entering medical schools in June 1942 complete the course in thirty-six consecutive months they will be graduated in June 1945 instead of June 1946. However, they will still require a year of internship, thus making them unavailable for military service until the end of June 1946. As an emergency measure the immediate gain is slight.

2. Many students have been accustomed to utilize the summer vacations to earn funds to finance their medical course. If summer vacations are to be eliminated, these students either will have to be financed from some other source or discontinue their medical education.

3. Many medical students enrolled in the Reserve Officers Training Corps are under obligation to serve a period of training in the field. This must be discontinued if the medical curriculum is to occupy thirty-six consecutive months.

4. If some students follow the thirty-six consecutive month concept and others try to continue the original plan of four years of nine months each, the physical facilities and the technical and teaching staffs will have to be greatly increased or devote far more time than is now given.

5. Unless colleges, universities and hospitals have their curriculums suitably integrated with the curriculums of the medical schools, the students will lose from three to six months spent waiting for entrance into medical courses or to internships in hospitals somewhere along the line.

These are a few of the problems that have been raised and for which solutions do not yet appear to be fully available. Most important, however, is the question of maintaining accepted medical standards. If more students are admitted and a larger percentage fails, little useful purpose will have been achieved. If examinations are abolished, if pressure on a faculty makes it pass unqualified men, if standards of study required for graduation are lowered so that a larger number of students each year receive the medical degree, the ultimate effect will be serious both on the army medical services and on service to the people. Such lowering of professional standards cannot be in the best interests of the nation.

Current Comment

PHYSICAL OR PSYCHIC ALLERGY

A woman aged 31 developed giant hives over her legs after swimming. When she washed with cold water, scattered hives would form. Previously she had not had asthma, hay fever or eczema. Intracutaneous tests with a routine group of inhalants and foods were negative. Dermographism was absent. However, when tested with a standard cold stimulus (cracked ice in a test tube) the patient developed well formed wheals without pseudopods after one minute's application. This sudden change in the patient's reactivity to cold coincided, according to Abramson,[1] with a recent mental conflict. The patient was depressed by the news of war fatalities involving intimate friends. The day previous to the occurrence of hives, while swimming, she had felt that she wanted to drown. On one occasion, despite a severe reaction after swimming, there were no symptoms suggestive of a histamine-like reaction. Abramson points out that the absence of pseudopods and the formation of giant hives without constitutional symptoms suggests that the phenomenon cannot be accounted for by the liberation of a histamine-like substance. The main feature of the case was the suddenness of the onset immediately after a relatively short period of mental conflict which endangered the patient's life. With the change in the patient's point of view the whealing response to cold has disappeared. The case represents a spontaneous recovery from a whealing response to cold without the use of histamine or any other desensitizing agent. While the report concerns but a single instance, so that conclusions can hardly be warranted, the record is suggestive.

1. Abramson, H. A.: Origin of a Whealing Response to Cold, Psychosom. Med., October 1941.

ROENTGEN THERAPY OF GAS BACILLUS INFECTION

Cantril [1] has recently deplored the lack of appreciation by physicians of the value of treatment of gas bacillus infection with the roentgen ray. Five cases are reported as successfully treated. "Débridement or other surgical procedures in the acute phase of an already established gas bacillus infection," he writes, "is not indicated when roentgen therapy is available. Any manipulation or operative procedure is best done after the acute gas infection has subsided or at least until adequate trial of roentgen therapy has been given. The technic of roentgen irradiation requires the use of large fields and the irradiation of far more of the body than the locally involved area. From 500 to 100 roentgens per field should be given two to three times daily for a period of three to five days." Four of his patients received adequate amounts of gas bacillus antitoxin; 1 patient received, in addition, multiple blood transfusions, and another patient had a limb amputated. In view of the generally accepted efficacy of the serum in the treatment of gas bacillus infection, it would be difficult to say whether the recovery of 4 patients was due to roentgen therapy or to serum therapy. The same criticism may be applied to the report of Faust,[2] who treated 5 patients with serum and the roentgen ray. The most enthusiastic proponent of roentgen therapy in gas bacillus infection is Kelly,[3] who reported 143 cases, some treated personally and others based on data from questionnaires returned by a hundred physicians scattered throughout the United States and Canada. Kelly and his co-workers were enthusiastic over the results of roentgen treatment of gas gangrene, saying that the results far surpassed those obtained with serums, débridement and amputations. They were inclined to regard roentgen therapy in gas gangrene as a specific and stated that, if it is employed during the first twenty-four hours, recovery will occur in all cases. Nevertheless Cubbins, Callahan and Scuderi [4] state "We are positive that the x-ray treatment of gas bacillus infection has little, if any, value. In 8 cases of proved gas infection that were treated with x-ray without surgery or antitoxin, there were 8 deaths. X-ray will destroy tissues and no amount of it will serve to disturb the growth and reproduction of gas bacillus when it is applied to cultures. We can see no reason for even considering x-ray in the treatment of these cases." Attempts to reproduce the clinical effects in animal experiments thus far have failed. Caldwell [5] induced gas bacillus infection in guinea pigs and treated them one to three hours after inoculation with from 100 to 200 roentgens. Of the 10 animals thus treated, 7 died after eight to eighteen hours. Apparently the determination of the specificity or efficacy of roentgen therapy in gas bacillus infection must await more rigidly controlled clinical investigations in an adequate number of cases.

1. Cantril, S. T.: Roentgen Therapy of Gas Bacillus Infection in Radiation Therapy, Staff J. Swedish Hosp. Seattle (supp.), May 1941.
2. Faust, J. J.: Report on X-Ray Treatments in Gas Gangrene Cases, Radiology **22**: 105 (Jan.) 1934.
3. Kelly, J. F.; Dowell, A.; Russum, B. C., and Colein, F. E.: The Practical and Experimental Aspects of Roentgen Treatment of Bacillus Welchii (Gas Gangrene) and Other Gas-Forming Infections, Radiology **31**: 608 (Nov.) 1938.
4. Cubbins, W. R.; Callahan, J. J., and Scuderi, C. S.: Compound Fractures of the Elbow Joint in Adults, Am. J. Surg. **42**: 627 (Dec.) 1938.
5. Caldwell, G. A.: Treatment of Gas Gangrene Experimentally Produced, J. Bone & Joint Surg. **23**: 81 (Jan.) 1941.

FINLAY INSTITUTE OF THE AMERICAS

On January 6 in the Medical School of the University of Havana an agreement was reached for the establishment of an organization known as the Finlay Institute of the Americas to foster research and education in the field of tropical disease and to provide for an increased interchange of medical students and teachers among scientific medical institutions in all the American nations. Mr. Basil O'Connor, at present president of the National Foundation for Infantile Paralysis, accepted the presidency of the executive council. Dr. James E. Paullin, president-elect of the American College of Surgeons, was appointed chairman of the Scientific Advisory Committee for the United States. Other members appointed to the executive council included Drs. Thomas Mackie, president of the American Society of Tropical Disease; Dr. Morris Fishbein, editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION; Dr. Edgar Mayer, associate professor of medicine in Cornell University and also in the University of Havana; Dr. Enrique Saladrigas, director of the Finlay Institute of the University of Havana; Dr. Rafael Menocal, professor of surgery in the University of Havana, and Dr. Felix Hurtado, assistant minister of public health of Cuba. Executive offices will be established both in Havana and in New York. The Cuban government agreed to provide $20,000 annually for maintenance of the organization. Substantial contributions were made by several American industrialists and philanthropists. In the course of the negotiations for the establishment of the Finlay Institute of the Americas Mr. O'Connor presented to President Batista of Cuba and to the minister of public health, Dr. Marruz, messages from President Roosevelt and Vice President Henry Wallace, indicating their approval of the project to foster more intense cooperation between scientific institutions of the Latin American countries. Mr. Donald Nelson, who accompanied the party to Cuba, also conferred with President Batista. The University of Havana and the medical school of the university, during the course of the negotiations, provided receptions by their faculties, and addresses were made by the American visitors and also by leading Cuban officials. Representatives of the Cuban Federation of Medicine also presented to the American delegation an offer of complete cooperation in the campaign for medical service in the war. The order of Carlos Finlay was conferred on the American visitors by President Batista. A constitution and by-laws are being prepared for the conduct of the new institute, which should serve a most useful purpose in fostering scientific interchange and good will among the medical professions of all the Latin American countries.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

PROVISION OF MEDICAL OFFICERS FOR MILITARY SERVICES

At the time of the Pearl Harbor incident, Dec. 7, 1941, the Army was short approximately fifteen hundred physicians to bring all existing installations up to war strength. Requisition was made on the Procurement and Assignment Service immediately to secure such physicians under the age of 36. The number of physicians in the service was adequate to meet all professional demands in the care of patients but was not sufficient to provide physicians for all organizations on a war strength basis. Therefore the Procurement and Assignment Service on December 18 authorized the publication of application blanks for enrolment with a view to meeting the immediate needs of the Army. These blanks have been circulated by THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION and by many state organizations. Some confusion has arisen in that many physicians interpreted the enrolment blank as another call for every physician in the United States to register. Actually, only those ready to volunteer for immediate service were wanted and only the applications of those capable of meeting specified qualifications are being forwarded.

The continued registration of all MEN UNDER 36 WHO ARE IMMEDIATELY AVAILABLE for military duty in the Army or the Navy will suffice to meet the immediate needs of the military services, at least until completion of the roster system now being established in the office of the Procurement and Assignment Service.

Within sixty days the Procurement and Assignment Service expects to publish the physical requirements for service with every military, governmental, industrial and civil agency utilizing the services of physicians, dentists and veterinarians. Each physician, dentist or veterinarian will be asked to make a self analysis of his physical condition, so that he may himself determine with which of the agencies he is physically qualified to serve. Shortly thereafter the Procurement and Assignment Service expects to mail a new questionnaire and enrolment form. Each professionally qualified person will be asked to state, first, that he will volunteer his services in the interest of the national emergency; second, to state his first, second, third and fourth choice of the agencies which he will be willing to serve for the duration of the war. A list will be furnished of every military, governmental, industrial and civil agency requiring the services of physicians, dentists or veterinarians.

On self analysis of his physical condition, each man will be thus able to determine whether his physical fitness qualifies him for duty with the requisitioning agencies. On receipt of the enrolment form the Procurement and Assignment Service will issue a certificate of enrolment and a numbered button which will certify that the recipient has offered his services in the interests of the national defense. Thus, those who remain at home in an essential capacity will derive the satisfaction of knowing that they have offered their utmost to the national emergency and that this offer has been formally recognized by the Procurement and Assignment Service.

SAM F. SEELEY, Executive Officer
MORRIS FISHBEIN, Chairman Committee on Information.
Procurement and Assignment Service.

PHYSICIANS NEEDED FOR RED CROSS BLOOD PROCUREMENT PROGRAM

The expansion of the blood procurement program under the auspices of the American Red Cross will require the services of physicians in a full-time capacity. In the near future there will be published in this section a statement as to the number of physicians required, the age group, the professional qualifications and a list of those to whom they will be asked to make direct application. The physicians wanted for this service will be preferably those over 45 years of age or, if under 45 years of age, not physically fit for the armed services.

OFFICE OF CIVILIAN DEFENSE REQUISITION FOR DEFENSE AREA DIRECTORS FILLED

The requisition which was published in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for Dec. 13, 1941 for two men between the ages of 45 and 60 for duty as reserve officers of the United States Public Health Service as defense area directors for the Office of Civilian Defense has been filled. Several hundred applications were received in the office of the Procurement and Assignment Service and were forwarded to the Office of Civilian Defense.

CANCEL DEFERMENTS OF RESERVE OFFICERS WHO ARE FEDERAL EMPLOYEES

The Secretary of War issued the following instructions, January 5:

1. In September 1940 the War Department promulgated a policy permitting Reserve officers who were employed in key civilian positions in the various governmental departments and agencies to be granted unlimited deferments from military duty by being transferred to the War Department Reserve Pool. Because of the present state of war, these deferments will be canceled, effective Jan. 15, 1942, and all affected Reserve officers will be considered available for active duty after notice of relief from the War Department Reserve Pool by this office.

2. Requests for limited deferments should be submitted in triplicate, addressed to the Adjutant General, Washington, D. C., and signed by the responsible head of the department or agency making the request. Such requests will receive favorable consideration, to the extent that military necessity permits, in exceptional cases only. No general or permanent deferments will be authorized. Requests for deferment submitted after active duty orders have been issued cannot be considered.

3. The following information should be furnished with each request for deferment: (*a*) Name of the officer in full (initials should not be used). (*b*) Rank and branch in which commissioned. (*c*) Home address as last reported to the War Department. (*d*) Date of birth. (*e*) Title of present position (governmental payroll designation). (*f*) Salary or wages. (*g*) Civil service rating, if any. (*h*) Length of time in present position. (*i*) Total time in the employ of the present department or agency. (*j*) Total time in federal employ. (*k*) Detailed description of present duties. Include information as to the availability of a replacement or the time required to train one. (*l*) Length of deferment desired (until———give date).

By order of the Secretary of War:

E. S. Adams,
Major General,
the Adjutant General.

HARVARD'S BASE HOSPITAL ORDERED ABROAD

Orders for the mobilization of Base Hospital Unit No. 5 have been received, it was announced by Harvard University, January 5. While preliminary orders advising personnel that they would be shortly called were received on December 24, the latest orders provide for report to an eastern seaboard camp in the near future and their departure from the country shortly thereafter. At the request of the university, Dr. Elliott C. Cutler, director, will not proceed with the unit. Dr. Thomas H. Lanman, chief of the surgical service of the unit, will serve as acting director. The request for Dr. Cutler's release was made because of the need of his services in Boston.

Base Hospital No. 5, organized by Harvard Medical School, is a continuation of Base Hospital No. 5 which operated in France during the last war. Associates of the following Boston hospitals and departments of Harvard University are included among the officer personnel: Boston City Hospital, Beth Israel Hospital, Boston Lying-in Hospital, Children's Hospital, Deaconess Hospital, Eye and Ear Infirmary, Faulkner Hospital, Hygiene Department of Harvard University, Harvard Dental School, Harvard School of Dental Medicine, Harvard Medical School, Massachusetts General Hospital and Peter Bent Brigham Hospital.

Among the nursing personnel will be forty-four nurses from the Boston area.

The officer personnel of the hospital at present is as follows:

Unit director: Lieut. Col. Thomas H. Lanman.

Surgical service: Lieut. Col. Thomas H. Lanman, chief; Major Augustus Thorndike, assistant chief; Majors Edwin F. Cave, J. E. Dunphy, Carlyle G. Flake, John H. Harrison, Robert Zollinger; Capts. Thomas W. Botsford, Thomas Cavanaugh, Stanley O. Hoerr, Lee G. Kendall, John L. Newell, T. B. Quigley, Charles P. Sheldon, Fiorindo A. Simeone, Dean W. Tanner, Richard Warren; 1st Lieuts. Chilton Crane, Charles L. Dimmler Jr., Robert G. Snow, Robert R. White.

Medical service: Lieut. Col. Theodore L. Badger, chief; Major Eugene O. Eppinger, assistant chief; Majors Harold F. Corson, J. E. Greene, Stanley Kimball, Harold Levine, Charles May, Henry N. Pratt; Capts. Arthur Baldwin, Richard V. Ebert, Charles P. Emerson, Joseph Frothingham, Paul Kunkel, Jack D. Myers, Carey M. Peters, Gordon A. Sanders, Roy L. Swank; 1st Lieuts. Samuel Asper, Henry H. Brewster, Joseph H. Burchenal, Sibley W. Hoobler.

Laboratory: Major Dale Friend, Capt. Joseph H. Bragdon, 1st Lieut. Richard Ford.

X-ray: Major Magnus I. Smedal, Capt. Donald P. Ham, 1st Lieut. Ralph C. Moore.

Headquarters: Capt. John J. Kneisel.

Registrar: Majors Beach Hazzard, Norman Vaughan, Quartermaster Corps; 1st Lieut. Frederick P. Ross.

Mess: Major George F. Wilkins.

Dental Corps: Major Moses S. Strock; Capts. Henry J. Carney, Harry Stone, George Sullivan; 1st Lieuts. Maurice Dinnerman, Gerald L. O'Neill, Maxwell Perman.

BLOOD BANKS FOR CIVILIAN DEFENSE

The Medical Advisory Board of the Office of Civilian Defense held a joint meeting with the Regional Medical Officers at the national headquarters in Washington, Dec. 8-9, 1941. Mayor La Guardia, U. S. Director of Civilian Defense, addressed the group briefly, urging action on two counts: organization of emergency medical field units and designation of field casualty stations in the target areas on both coasts.

The medical defense officials decided that it is necessary that blood banks, as well as collecting stations for plasma and serum, similar to those developed by the American Red Cross for the Army and Navy, be established for civilian use. It was pointed out that a supply of whole blood and of plasma and serum for use among civilians is essential, as the armed forces will not be able to release any of their supply under conditions of actual warfare.

Dr. Wallace D. Hunt, medical officer for the Ninth Civilian Defense Region with headquarters in San Francisco, reported that the important cities of the West Coast, especially those in California, had well developed disaster services and that these were being rapidly integrated into the comprehensive civilian defense program.

Members of the Medical Advisory Board who attended the meeting were Drs. George Baehr, New York, chairman of the board and chief medical officer of the Office of Civilian Defense; Robin C. Buerki, Philadelphia; Elliott C. Cutler, Boston; Oliver B. Kiel, Wichita Falls, Texas; Albert McCown, Washington, and Huntington Williams, Baltimore. Dr. Fred Rankin, Lexington, Ky., was unable to be present.

Regional medical officers present, in addition to Dr. Hunt, were Drs. Allan M. Butler, Boston, first civilian defense region; H. Van Zile Hyde, New York, second region; W. Ross Cameron, Baltimore, third region; Judson D. Dowling, Atlanta, Ga., newly appointed to the fourth region; William S. Keller, Columbus, Ohio, fifth region, and Witten B. Russ, San Antonio, Texas, eighth region.

Others present included Miss Mary Beard, director of nursing service, American Red Cross; Dr. James A. Crabtree, executive secretary, Health and Medical Committee of the Office of Defense Health and Welfare Services; Dr. Thomas Parran, Surgeon General, and Dr. Erval R. Coffey of the U. S. Public Health Service and Dr. Martha Eliot of the U. S. Children's Bureau.

SANITARY ENGINEERING IN CIVILIAN DEFENSE

Ralph E. Tarbett, senior sanitary engineer, U. S. Public Health Service, is chief sanitary engineer of the medical division of the Office of Civilian Defense. Mr. Gordon E. McCallum, sanitary engineer, U. S. Public Health Service, has been commissioned in the Public Health Service Reserve and assigned to the third civilian defense region (Pennsylvania, Maryland, District of Columbia and Virginia) plus West Virginia and Ohio. Mr. McCallum is stationed in Washington. Mr. John H.

Brewster, Troy, N. Y., at one time with the Indiana and later with the New York state health department, has also been commissioned in the Public Health Service and assigned to the first and second defense regions.

The National Technological Civil Protection Committee, an advisory group to the War Department, has agreed to serve in the same capacity to the Medical Division of OCD in matters of public health engineering. Mr. Walter Binger of New York, representing the American Society of Civil Engineers, is chairman of this committee. Other members represent other national engineering and related organizations.

The sanitary engineering section will work through state defense councils with state health departments in planning to meet the problems that may arise from belligerent action. Of these, the maintenance of a continuous supply of safe water is of first importance.

CIVILIAN DEFENSE IN THE DISTRICT OF COLUMBIA

The plans of the third defense area, comprising the District of Columbia, Maryland, Virginia and Pennsylvania, were discussed on December 16 at a conference in Washington called by Dr. W. R. Cameron, Hagerstown, Md., medical officer of the third defense area, and attended by Drs. W. P. Dodds of Harrisburg, Pa.; C. R. Edwards and R. H. Riley, both of Baltimore; William Grossmann and I. C. Riggin, both of Richmond, Va.; George C. Ruhland and John Reed of the District of Columbia, and army and navy officers. The Maryland, the Virginia and the District of Columbia medical officials agreed on plans for two five hundred bed evacuation hospitals in Bethesda, Md., and the Arlington, Va., area to be used for the less seriously injured in order to make beds available in the city hospitals in case of need of emergency treatment of numerous casualties.

Plans to mobilize the fifteen hundred doctors in the Washington area for emergency civilian defense medical work were discussed before the Medical Society of the District of Columbia, December 10, by Dr. Oscar B. Hunter, assistant chief civilian defense medical officer. Physicians will be assigned to the various hospitals from which they will conduct emergency civilian defense work. Among the medical officers listed as assistant chief medical officers are William E. Clark (voluntary agencies), W. R. Morris (casualty stations), Philip O. Pelland (transportation), Paul F. Dickens (government agencies), James A. O'Keefe (organization assistant), Phillip T. Johnson (organization assistant for Negro medical group), William B. King (liaison officer for metropolitan Virginia), Reed N. Calver (liaison officer for metropolitan Maryland), O. K. Fike (hospital mobilization) and Oscar B. Hunter (personnel).

LECTURES ON FIRST AID

The Medical Society of the County of New York, the New York Academy of Medicine and the chief of Medical Emergency Service for Manhattan sponsored a series of four lectures and demonstrations on first aid given to New York physicians the early part of January at the New York Academy of Medicine building, 2 East 103d Street. Dr. George Baehr, director of the medical division, National Office of Civilian Defense, Washington, D. C., discussed the organization of medical emergency service in New York; Capt. Charles D. Scully of the New York chapter of the American Red Cross discussed principles and management of first aid; Dr. Robert H. Kennedy, director of surgery at Beekman Hospital and chairman of the National Fracture Committee, the emergency care and transportation of persons with fractures; Dr. Frederick W. Bancroft, New York, the emergency care of abdominal, head and chest injuries and burns, and Dr. Lawrence M. Thompson the emergency care of wounds, hemorrhage and shock. The lectures were based on the course in advanced first aid prepared by the American Red Cross and the Office of Civilian Defense and were announced by Dr. Condict W. Cutler Jr., borough chief of emergency medical service. Dr. Baehr said that emergency medical field units had been organized and drilled in eighty hospitals in the metropolitan area and that the medical personnel of this emergency medical service now comprised two thousand, one hundred and forty-eight physicians and nurses. These field units are subdivided into emergency squads, and certain squads are on emergency call day and night.

MEETING OF HOSPITAL PROTECTION COMMITTEE

The Subcommittee on Air Raid Protection of Hospitals of the Medical Advisory Board, Office of Civilian Defense, met in New York, Dec. 6, 1941, to complete a report, which will shortly be published by the Office of Civilian Defense as an official bulletin. Present at the meeting were Drs. George Baehr, chairman of the Medical Advisory Board; Robin C. Buerki, Philadelphia, a member of the Medical Advisory Board and chairman of the subcommittee; Asabel J. Hockett, New Orleans, Joseph Turner, New York, and Anthony J. J. Rourke, New Orleans, members of the committee; Ward L. Mould of the Washington headquarters; John J. Bourke, Albany, N. Y., research director, New York State Health Preparedness Commission; H. Van Zile Hyde, New York, regional medical officer for the second region, and Dr. James M. Mackintosh, professor of public health, University of Glasgow, Scotland, and former chief medical officer of the Scottish Ministry of Health, who has been acting as a consultant to the subcommittee.

ARMY SCHOOLS FOR COOKS AND BAKERS

There are now about fifty Army bakers' and cooks' schools throughout the nine corps areas, the Quartermaster Corps announces, and they are turning out bakers, cooks, mess sergeants and mess officers with clocklike regularity. At a typical school, 5,648 students were graduated during the past year, compared with an average of 175 a year that had been graduated since the World War.

In general, courses have been revised to provide shorter and more intensive training. The mess officers' course has been cut to one month, and officer students spend forty hours in actual classroom work. Mess sergeants also complete their training in one month, but all the students in this course are already graduate cooks. Student bakers and cooks are put through a two months course.

EMERGENCY MEDICAL EQUIPMENT

The Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York, sent eight emergency medical field sets, January 2, to medical directors of the Second Civilian Defense Region, comprising New York, New Jersey and Delaware. Each set consists of two portable cases equipped with instruments and supplies, which will be placed in hospitals and first aid posts in various locations, whence they can be readily transported to potential points of disaster. Plans are being made by the committee for a nationwide campaign to provide quantities of these sets in each of the nine civilian defense regions set up by the Office of Civilian Defense; it is estimated that seven hundred and twenty-four sets will be required to meet the needs of New York City alone.

BRYN MAWR NAVAL HOSPITAL PHYSICIANS ORDERED TO DUTY

Eighteen physicians of the staff of Naval Base Hospital No. 33, organized at Bryn Mawr Hospital, Pa., were ordered to report for active duty at the Navy Yard, Washington, D. C., January 5. This unit is expected to take over a naval base hospital at some undesignated location. The remainder of the medical complement and enlisted personnel will be made up in the field. The head of the unit is Dr. George Wagoner of Haverford, chief of orthopedics at Bryn Mawr Hospital; the medical chief is Dr. John K. Durkin and the surgical chief Dr. Frederick R. Robbins, both of Bryn Mawr. This is the first of five military hospitals in the Philadelphia area to be ordered to active duty.

ORGANIZATION SECTION

MEDICAL RELATIONSHIPS OF THE AMERICAN NATIONS

LOIS STICE
CHICAGO

The United States Department of State in 1938 established a Division of Cultural Relations. In 1940 the Office of the Coordinator of Commercial and Cultural Relations between the American Republics now called Office of the Coordinator of Inter-American Affairs, was established with Nelson Rockefeller at its head. There is also an Interdepartmental Committee on Cooperation with the Latin American Republics, in which seventeen or eighteen government agencies are represented.

Older than any of these and forming a background for their development is the Pan American Union, founded in 1890 as the "Commercial Bureau of American Republics" following the first International Conference of American States. In 1902 the second conference of American states created the Pan American Sanitary Bureau, separate from the Pan American Union but cooperating with it and maintaining offices in the beautiful Pan American Union building, one of the show places of Washington. This bureau handles all medical and health questions that come to the union.

The Pan American Sanitary Bureau holds a conference every few years; the next will be in Rio de Janeiro in 1942. Between times the bureau calls to Washington health officials of the twenty-one republics for the Pan American Conference of Directors of Health. Thus the public health problems of the Western Hemisphere are discussed in an atmosphere of friendly and cordial cooperation.

The Rockefeller Foundation has had a powerful influence in developing mutual understanding between Latin America and the United States with its fellowships and study tours for health officials, its support of medical schools and public health institutions and subsidy of rural health organizations, as well as its direct scientific work.

More than twenty years ago, for instance, the foundation began to encourage an "institute of hygiene" at São Paulo, Brazil. Through the years it has quietly continued to help in similar ways. One of the latest developments is an arrangement concluded with the government of Ecuador for a national institute of hygiene at Guayaquil. The foundation's policy is to support such undertakings and gradually to withdraw as the authorities are able to take them over. Not only will it contribute equipment and a part of the funds for maintenance of the new institute until Ecuador assumes full responsibility five years hence, but it has awarded fellowships to young men to study in the United States before taking charge of its technical departments.

Spectacular among the foundation's activities in South America has been its fight against yellow fever. After ten years of work, it was thought that yellow fever had been eliminated from the Americas, but suddenly in 1928 the disease flared up in Brazil. The fight began all over again. Intensified studies in subsequent years have led to the discovery of a new type of jungle yellow fever and to the development of a vaccine. As a result of studies in Colombia in 1940 it is now possible by tests on animals to determine the risk to human beings entering a region. Formerly it was necessary to wait until some one died of the disease before the danger was discovered.

Parallel with the activities so far outlined, private medical organizations were making many contributions to inter-American acquaintance. Most of us have been blissfully ignorant of these efforts, which were unheralded outside the medical profession.

From 1919 through 1928 the American Medical Association published an edition in Spanish of its official publication, THE JOURNAL. Its library has for many years indexed the leading medical journals of the rest of the hemisphere and THE JOURNAL each week has published abstracts of their most important articles, thus bringing the best medical literature published in Spanish and Portuguese on this side of the Atlantic to the attention of North American physicians.

The American College of Surgeons has since its founding in 1913 offered fellowship to Central and South American surgeons, and its officers made numerous tours to the Latin American countries in the interest of closer ties among colleagues of the hemisphere. Recently the college reported that it has two hundred and forty-six Latin American fellows, of whom a goodly number attended the annual congress in Boston in November.

For the past five or six years the American Hospital Association has had a committee on Latin American relations. Now this association is sponsoring an Inter-American Hospital Association, formed last September in Atlantic City. The American Public Health Association opened its membership to health authorities of Mexico, Cuba, Central America and South America more than fifty years ago and now has members in sixteen of those countries. Twenty-four public health officials of Latin American countries were special guests at the October meeting of the association at Atlantic City.

CONVENTIONS

There have been Pan American medical congresses from time to time for many years. The American Medical Association took the lead in organizing an important one as far back as 1893 in Washington, D. C., inspired by celebrations of the four hundredth anniversary of Columbus's voyage to the New World. THE JOURNAL of Sept. 9, 1893 made this editorial statement:

> The Congress is looked upon as the initial step towards cementing the grand brotherhood of American States into commercial and professional union. Political union may not be desirable, but commercial and professional unity of action will develop the Americas as nothing else could develop them. The republican idea, too, will gain new strength throughout the world as an indirect effect of these periodical exhibitions of power.

Another passage that sounds as if it might have been written during the present recrudescence of interest in inter-American relations occurred in the presi-

dential address of Dr. William Pepper, then president of the University of Pennsylvania, who quoted advice from Benjamin Franklin:

> It is a true saying that to know is to excuse and more than this, in regard to nations if not strictly in regard to individuals it may be added that to know is to love. We turn with quickened interest to the sage advice of the illustrious Franklin, who in 1749 embodied in his plan for the organization of the University of Pennsylvania an earnest advocacy of the thorough teaching of the Spanish and Portuguese tongues as likely to hasten the development of those reciprocal relations which he foresaw would inevitably arise between the countries of the two Americas.

This brilliant 1893 congress was the beginning of a series that ended during the upheaval of the World War.

Five Pan American congresses on tuberculosis have been held, the latest in October 1940 in Buenos Aires and Córdoba, Argentina. A North American physician who attended the recent one wrote later of the Argentine physicians: "Their hospitality is magnificent and their desire to exchange ideas seems genuine. It is my belief that we should reciprocate to the full extent that they desire our participation."

The second Pan American Congress of Endocrinology was held in March of this year (1941) in Montevideo, Uruguay. Endocrinologists from many parts of the United States made this trip.

Back in 1925 a group of New York physicians organized the Pan American Medical Association as an agency through which they could promote inter-American congresses and extend courtesies to visiting physicians from the other American republics. Seven congresses have been held, some of them in connection with cruises of several weeks' duration. On these trips physicians traveled first to Havana, then Panama, Mexico City, Dallas, Venezuela, Brazil and in 1938 to Havana and the West Indies again. The eighth congress is scheduled for Buenos Aires in August 1942.

Several years ago a number of New York physicians interested in physical therapy organized the Latin American Congress of Physical Therapy, X-Ray and Radium, which visited Mexico City for its first meeting and a few years later took a similar trip to Guatemala City. Still another society that has devoted itself to Latin American friendship is the International Spanish-Speaking Association of Physicians, with headquarters in New York.

Medicine has played a part in several general congresses in which the Americas have joined for the promotion of both scientific knowledge and mutual acquaintance.

The American Scientific Congress, which met with great pomp in Washington in May 1940, was the eighth of a series that began in 1898. One of its eleven sections presented an impressive program on public health and medicine. An announcement of one of the earlier congresses in this series indicates that friendship between the Americas has long been a hope of scientific men, expressed in this declaration:

> These Pan American Scientific Congresses, as must be apparent to your discernment and to that of your fellow members, are of the utmost and ever increasing importance both in the ideological field and in connection with international solidarity.

Seven meetings have been held of the Pan American Child Congress, which devotes a major part of its program to discussions of health and medical problems. The eighth congress was to have been held in San José, Costa Rica, in 1939, but events of that fateful period caused its postponement. Before the United States entered the war, plans were in the making to hold the deferred meeting in Washington next year.

With the experience of these earlier undertakings as a basis, Pan American relations in medicine have expanded in unison with the general awakening of the North and the South to the need for common action.

The tragedy of Europe has extinguished for the time being and possibly for years to come many international medical organizations which brought together medical men of all countries every few years and thus contributed to the worldwide dissemination of medical knowledge. Forced abandonment of international gatherings has given still another stimulus to intermingling of North, South and Central Americans. Physicians who once enjoyed meeting their colleagues from all continents have begun to build up Pan American assemblies to take the places of those of worldwide membership.

When the last International Congress of Microbiology met in New York in September 1939, just as war broke over Europe, an Inter-American Society of Microbiology was organized on the spot. Plans were started for a congress in Rio de Janeiro in 1942.

That same fall eye specialists attending the American Academy of Ophthalmology and Otolaryngology, seeing that the International Congress of Ophthalmology would be disrupted, laid plans for a Pan American Congress of Ophthalmology.

That meeting, held in Cleveland in October 1940, brought about twenty eye specialists from Brazil, Cuba, Chile, Costa Rica, Puerto Rico, Colombia, Guatemala and Panama. It resulted in "a definite and marked entente cordiale among the ophthalmologists of North, South and Central America," those who carried the meeting to a successful conclusion reported afterward. A permanent organization was formed and many plans are now being evolved for exchanges of medical journals, exchanges of students and another meeting in Montevideo, Uruguay, in 1943.

The Catholic Hospital Association welcomed to its meeting in Philadelphia last June representatives of ten republics of the South. There it was pointed out that hospitals were founded in the Western Hemisphere by Spanish pioneers long before the early settlements in the eastern part of North America. Plans to admit hospitals of Mexico to the association are to be presented next year and, as occasion arises, those of the South American republics will also be admitted, it was predicted.

Another step made by hospital groups was the Inter-American Institute for Hospital Administrators held in December 1940, when hospital officials from ten countries in the Caribbean area gathered in the beautiful old city of San Juan, Puerto Rico, for two weeks of discussions. Puerto Rico is in the unique position of belonging both to the United States and to the Ibero-American countries, to the North by political ties and to the South by ties of language and origin.

"A cultural, social and scientific bridge between the Americas passes through the West Indies, and the medical pillars of this bridge were unquestionably strengthened by the Inter-American Institute," one of the participants reported.

Cancer specialists recently announced a Pan American League Against Cancer to replace the International Union Against Cancer, now unhappily in eclipse because of the war. The league is working toward a cancer

congress to be held in Brazil in 1942. Radiologists are also exploring the idea of a Pan American congress.

The International College of Surgeons turned its 1941 assembly into an Inter-American meeting in Mexico City with speakers from a dozen or more of the Latin American countries on its program. Dentists too are contributing to the campaign for mutual acquaintance. The Mexican Association of Orthodontia organized its third "medicodental" convention in Mexico City in June and invited not only dentists but many physicians from the United States to present papers.

Now comes the American Medical Association, with its sixteen scientific sections representing all specialties in medicine, with plans to make its ninety-third annual session in Atlantic City in 1942 a Pan American meeting, almost fifty years after the great Columbian celebration in Washington.

The Board of Trustees at the Cleveland meeting last June reported that it had been "impressed with the importance of facilitating further cooperation of this type in the interest of scientific advancement and unity of the American continents."

The House of Delegates, the official legislative body of the Association, adopted the following recommendation introduced by the Council on Scientific Assembly, the group which plans the scientific sessions:

> The Council on Scientific Assembly recommends to the House of Delegates of the American Medical Association that the annual meeting to be held in Atlantic City in 1942 be made a Pan American meeting and that representatives from all South and Central American countries, Mexico, Cuba and Puerto Rico be invited to attend and to participate in the scientific session program.

The Delegates then asked the Trustees to appoint a Commission on Pan American Relations. This was done immediately and the group has already started that work behind the scenes which must precede a successful convention.

Convention visits are of course fleeting. They are serving as an introduction, but other things are being done on a personal basis. The U. S. Department of State began last January a policy of inviting distinguished leaders of the other American republics to visit the United States for two or three months each. There have been several physicians among these guests of the government. A professor of psychiatry in São Paulo, Brazil, who is also president of a Brazilian organization for advancing cultural relations with the United States, came in the spring and an Argentine radiologist in the summer. Both attended medical meetings and visited hospitals and universities.

Besides these visitors coming by official arrangements, many are coming on their own initiative. One alert Brazilian eye specialist this year made his fourth annual trip to attend a convention in his field.

SCHOLARSHIPS

Meanwhile the "norteamericanos" are finding their way south, some under the State Department's travel grants, others under diverse auspices. Already mentioned are those who have attended Pan American conventions. In the past few months a Harvard teacher and one from Cincinnati have gone to Bogotá, Colombia, to lecture to physicians and medical students, and a Philadelphia specialist to advise on the building of a tuberculosis sanatorium. The president of the Pan American Congress of Ophthalmology flew to Brazil in July to read a paper at the national meeting of eye specialists in Rio de Janeiro.

Most productive perhaps of all means of interchange between the Americas is the exchange of students and professors. The State Department reported a few months ago that about fourteen hundred students from the other republics were in the United States in 1940-1941.

Long before the present awakening, or reawakening, of interest, certain far seeing and wide ranging agencies were encouraging students of the Americas to study in other parts of the hemisphere. The International Institute of Education, the Rockefeller Foundation and the Guggenheim Foundation have been actively promoting the interchange for years, and their efforts have increased many fold in the recent past.

Cornell University Medical College, New York, and the University of Havana have an interesting arrangement for exchanging students and faculty members for several weeks at a time for periods of study. The plan has apparently worked well, for it was begun with an agreement for only one year and was continued last year for another period.

Now the governments of the republics are taking a hand. Several months ago the State Department reported that fourteen graduate students were studying in the United States under the terms of the Convention for the Promotion of Inter-American Cultural Relations, signed at Buenos Aires in 1936. Three of this group are physicians, including one from remote Paraguay.

Another government project is under the egis of the U. S. Public Health Service, which has made available fellowships "in the sciences related to public health." These cover a wide field, including medicine, dentistry, pharmacy, nursing, sanitary engineering, vital statistics and bacteriology. The fellows are selected by the Surgeon General on recommendation of the Pan American Sanitary Bureau with the approval of the Secretary of State. Newest of all are the hospital internships arranged for graduates of Latin American medical schools through the cooperation of the Office of the Coordinator of Inter-American Affairs (popularly called the Rockefeller Committee), the Pan American Sanitary Bureau and the participating hospitals and clinics. Thirty-seven medical graduates arrived in August to begin work under this arrangement.

In recent months numerous fellowships and scholarships have been offered by special groups. The American Foundation for Tropical Medicine has established fellowships that will allow young physicians to study tropical medicine at Tulane University in New Orleans. The Cleveland Clinic has invited a young Argentine surgeon to spend a period of study on its staff. The Dazian Foundation, bequest from the fortune of a famous theatrical costumer, is financing a fellowship at Mount Sinai Hospital, New York.

STUDY OF LANGUAGE

Efforts to foster more intimate relationships in the field of medicine and its related sciences are taking other forms too. Several enterprising organizations have issued some of their literature in Spanish in order to make special information available to Spanish and Portuguese speaking physicians. If one may judge from remarks heard in a recent discussion, this service will be appreciated. At a gathering in honor of a group of Mexican educators, one of the visitors was asked whether medical textbooks of the United States were widely used in Mexico. Regretfully he replied that they were not, first, because they were too expensive and, second, because too few physicians in Mexico read English.

As to the language barrier, it may be said that this is being overcome on both sides of the border. This same group of Mexicans reported that English is now a required subject in the schools of Mexico. Most of the visitors who come from the other republics have bestirred themselves to learn English either in school or as a prerequisite to their trips.

Now in the English speaking part of the hemisphere, where the population has been so predominantly of the English tongue that it has never been forced to learn other languages, one hears of Spanish and Portuguese classes on every side. A group of Chicago physicians has engaged a Spanish teacher to come to their hospital several times a week and put in an hour or so drilling the doctors in order that they may better understand and deal with their Spanish speaking students.

A word just here in favor of Portuguese, which seems to have eluded North Americans almost entirely. Brazilians point out that South America has a Portuguese speaking population practically as large as that which speaks Spanish and they cannot help feeling that at least part of the translations and the lessons now in progress should be in Portuguese.

What of the conventions in which physicians of three languages mingle? This problem was admirably solved at one meeting by the use of lantern slides. Condensed versions of all papers were translated into Spanish or English, as was necessary, and these versions were shown on slides, giving summaries in the other language as the speaker progressed. The young woman who made the translations sat by the projector with a full copy of the paper and carefully listened as she directed the placing of the slides on the screen.

Returning to the recital of some specific things that have been done in the matter of publications: First, perhaps, should be mentioned the *Bulletin of the Pan American Sanitary Bureau,* which has long been published in English, French, Spanish and Portuguese. The U. S. Pharmacopeia, vast official list of drugs used in North American medicine, appeared in Spanish for Pan American use in 1938. *Modern Hospital,* a monthly magazine, published in 1940 "El Libro del Hospital Moderno," a reference book on hospital practice. The National Foundation for Infantile Paralysis this year issued its valuable little pamphlet "Nursing Care of Patients with Infantile Paralysis" in Spanish.

STRENGTHENING INTERNATIONAL TIES

The *American Review of Tuberculosis* began in October to publish summaries of its articles in Spanish. "It is hoped that this will increase the usefulness of the *Review* for our Latin American colleagues and stimulate their interest in the work published in the *Review,*" the announcement said. "It should further strengthen the international ties of tuberculosis work."

Almost every one knows that the matter of unfavorable exchange of money is a standing difficulty of the Latin American countries in their dealings with the United States. At least one scientific group has made a move to alleviate this handicap in its field. The trustees of *Biological Abstracts* have offered to reduce the price of that publication to any one who wishes to send a set to a Latin American institution. It has been found that about one hundred and fifty research and educational institutions in Latin America did not subscribe to this tool of the scientist either because they did not have funds or because of the inequality of exchange.

More thinking along this line appeared in a letter to *Science* not long ago. The writer observed that few North American scientific periodicals go to Latin America and thought one reason might be the subscription rates, extremely high when translated into Latin American currencies. He had an idea that societies which could afford it might establish "exchange memberships" with similar organizations in the other countries. The exchange members would receive extra copies of their journals to be mailed to the members abroad, who would do the same with their periodicals. He also thought some societies might set up subscription rates in the currencies of the Latin American countries.

A different step in practical collaboration was taken recently by the University of California when it began small shipments to Lima, Peru, of radioactive phosphorus produced in the university's pioneering radiation laboratory by the cyclotron. This makes it possible for Peruvian medical authorities to try the radioactive material as it is being cautiously tried in this country in the treatment of cancer, leukemia and other diseases in which radium itself has been found beneficial. The artificially made radiations last only about two weeks, but air transportation takes the phosphorus to Lima within two or three days after its manufacture, leaving about ten days in which it is usable.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Bills Introduced.—H. R. 6316, introduced by Representative Martin J. Kennedy, New York, provides compensation for injuries or death sustained by volunteer civilian defense workers in line of duty. H. R. 6324, introduced by Representative Ditter, Pennsylvania, provides that each person who enters into the armed forces of the United States shall be given a physical examination by medical officers at the time of entry into service. On the termination of such service, the bill provides, each person shall be given another physical examination by medical officers and a record shall be made of the findings of such examination and of any injuries, illnesses or disabilities suffered by him during his period of service. Each person who enters into service must be given a medical statement showing any physical defects noted either on the examination given at the time of entry into service or on the examination given at the termination of the service.

DISTRICT OF COLUMBIA

Bills Introduced.—S. 2183, introduced by Senator McCarran, Nevada, proposes to amend the healing arts practice act by providing for the annual registration of licentiates and by imposing a $2 annual registration fee. H. R. 6297, introduced by Representative Robinson, Utah, provides for the issuance of a license to practice chiropractic to Wesley K. Harris. H. R. 6344, introduced by Representative Reece, Tennessee, provides for medical examinations of persons charged with driving while under the influence of liquor.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Changes in Health Personnel.—Dr. Ralph L. Best, Drumright, Okla., has been made health officer of Greene County with headquarters in Eutaw.——Dr. Corinne S. Eddy, Centerville, has been appointed health officer for Bibb County; she was formerly connected with the unit in Cleburne County.

Quarters for Industrial Hygiene Division.—Plans have been announced to move the state division of industrial hygiene from Montgomery to Birmingham, with space in the city hall building, where a laboratory will be installed. Dr. Edwin H. Place, Montgomery, was recently placed in charge of the division. The change is being made because Birmingham is the most logical center of industrial activity and because of demands in connection with the defense program, it was stated.

CALIFORNIA

Personal.—Dr. Ladislav Stolfa, Marysville, has been named medical superintendent of Yuba County Hospital, Marysville. ——Dr. Charles H. Kellaway, director of the Hall Research Institute, Melbourne, Australia, was a recent visitor at the University of California Medical School, San Francisco.

Buenos Aires Physician Chosen Herzstein Lecturer. —Dr. Eduardo Braun-Menéndez, lecturer in physiology and director of cardiovascular investigations, Institute of Physiology of the University of Buenos Aires Faculty of Medical Sciences, has been chosen to deliver the Herzstein Lectures this year. The lectures are delivered on alternate years under the direction of the University of California Medical School and Stanford University School of Medicine, San Francisco. This year they will be given at the University of California, extension division auditorium, March 9-13. Dr. Braun-Menéndez's topic will be "Experimental Renal Hypertension." The Herzstein lectures were established in 1929 under a provision of the will of the late Dr. Morris Herzstein of San Francisco.

CONNECTICUT

State Society Creates Associate Membership.—To permit medically prominent persons in Connecticut who are not licensed to practice in the state to join with the state medical society in furthering its objectives, the society amended its by-laws at its annual session in 1941 to provide for associate membership. As a result of this action the state medical journal for January announces the following associate memberships:

Harold S. Burr, Ph.D., E. K. Hunt professor of anatomy, Yale University School of Medicine, New Haven.

Dr. John F. Fulton, Sterling professor of physiology at Yale medical school.

Dr. Howard W. Haggard, director of laboratory of applied physiology at Yale University.

Ira V. Hiscock, C.P.H., professor of public health at Yale medical school.

Dr. Cyril N. H. Long, Sterling professor of physiologic chemistry at Yale medical school.

Friend Lee Mickle, M.Sc., director of bureau of laboratories of the Connecticut State Department of Health, Hartford.

William C. Welling, B.A., director of the bureau of vital statistics of the state department of health, Hartford.

DISTRICT OF COLUMBIA

Guest from Haiti.—Camille Lherisson, D.P.H., professor of biology, National School of Medicine, Port-au-Prince, Haiti, has arrived in Washington at the invitation of the U. S. Department of State to visit schools of medicine and departments of biology throughout the country. Dr. Lherisson received his degree in public health at Harvard University. He also studied at McGill University Faculty of Medicine, Montreal, Canada.

Garrett Resigns as Health Security Administrator.— Mr. Ross Garrett, administrator of Health Security Administration since its organization in 1938, has resigned. Mr. Garrett organized the Central Admitting Bureau for Hospitals and the Medical Dental Service Bureau in 1935. These organizations were consolidated in 1938 and became known as the Health Security Administration. Mr. Garrett has set up offices in Washington in the Medical Science Building and, according to his letterhead, renders consulting service in hospital and health activities.

ILLINOIS

New Director of Tuberculosis Control.—Dr. Edward K. Steinkopff, Milwaukee, medical consultant to the Anti-Tuberculosis Association of Wisconsin, has been appointed chief of the division of tuberculosis control of the Illinois State Department of Health, effective February 1, with headquarters in Springfield. The appointment inaugurates a new program of case finding and tuberculosis control in the state, based on an expected increase in the incidence of tuberculosis anticipated usually under war conditions. In announcing Dr. Steinkopff's appointment, Dr. Roland R. Cross, Springfield, state director of public health, stated that provisional tabulations show that there was 10 per cent more tuberculosis reported in the state in 1940 than in 1939 and perhaps 15 per cent more in 1941 than in 1940. Dr. Steinkopff graduated at the University of Illinois College of Medicine in 1929.

Chicago

Branch Meetings.—Dr. Roy R. Kracke, professor of pathology and bacteriology, Emory University School of Medicine, Emory University, Ga., discussed the "Effect of Drugs on the Hemopoietic System" before the North Suburban Branch of the Chicago Medical Society, January 8.——Dr. Alfred W. Adson, Rochester, Minn., addressed the North Shore Branch, January 6, on "Diagnosis and Treatment of Protruded or Ruptured Intervertebral Disk."

New Executive Appointments at St. Luke's.—Dr. Ambrose P. Merrill Jr., assistant director of St. Luke's Hospital, has been appointed medical director of the hospital, a newly created position. Leo M. Lyons, city relief commissioner since July 1936, has been appointed executive director, effective February 1. He will be directly responsible to the president of the hospital for its general management. Mr. Lyons began his public career in the Rockford public schools, where he was director of health education and recreation from 1915 to 1930.

Personal.—George F. Forster, Ph.D., has resigned as assistant chief of the division of laboratories, Illinois State Department of Health, to become associate professor of bacteriology in Loyola University School of Medicine, effective January 1. Dr. Forster received his Ph.D. degree at the University of Wisconsin, Madison, in 1922.——Fred C. Koch, Ph.D., Frank P. Hixon distinguished service professor emeritus of biochemistry and recently retired as chairman of the department of biochemistry, University of Chicago, has been elected an honorary foreign member of the National Academy of Medicine of Buenos Aires.

Research Committee on Cancer.—The University of Chicago announces four new appointments to its committee on cancer: Dr. William Bloom, professor and chairman of the department of anatomy; Earl A. Evans Jr., Ph.D., associate professor of biochemistry; Carl R. Moore, Ph.D., professor and chairman of the department of zoology, and Dr. Arno B. Luckhardt, professor of physiology. The new appointments bring to eighteen the committee members now engaged in basic research on cancer. The committee was created in 1938 to correlate the university's diverse research facilities in a clearing house for the thirteen departments, ranging from physics to surgery, which are participating in the research. The first gift the committee on cancer received was one of $2,250 to establish a lectureship on cancer. This gift was made by the Educational Association on Cancer, an organization of Chicago women which for many years has been interested in the acquisition and dissemination of information on cancer.

INDIANA

Program on Nutrition.—At a meeting of the Indiana State Nutrition Council in Indianapolis on November 29 Dr. John W. Ferree, Indianapolis, director and secretary of the state board of health and chairman of the council, appointed five subcommittees to organize a statewide educational program and plan a state nutrition conference.

State Board Creates Public Relations Post.—Mr. Creath Smiley, who has been associated with the state department of public welfare, has been appointed public relations counsel for the state department of health, a newly created position. Mr. Smiley has been handling radio and newspaper publicity for the department of welfare. In his new position he will prepare interpretative articles for state newspapers and magazines and act in an advisory capacity in matters relating to public relations. He graduated at the Indiana University School of Journalism in 1938.

Annual Secretaries Conference.—The Indiana State Medical Association announces its annual secretaries' conference, to be held at the Indianapolis Athletic Club, Indianapolis, January 25. Among the speakers will be:

Clarence A. Jackson, Indianapolis, chairman and civilian defense director, Indiana Defense Council, What Is Expected of Physicians in the Plans for Civilian Defense?

Dr. Jonathan Forman, Columbus, Ohio, Methods in Securing an Enabling Act for Prepaid Medical Care.

Dr. Samuel F. Seeley, major, medical corps, U. S. Army, and executive secretary, Procurement and Assignment Service for Physicians, Dentists and Veterinarians, Washington, D. C., Future Needs of the United States Army as to Physicians.

Dr. Charles H. Phifer, Chicago, president of the Illinois State Medical Society, Social Security Medical Problems.

The annual dinner in the evening will be addressed by General Lewis B. Hershey, director, Selective Service System, Washington, on "Procurement and Assignment of Physicians for Defense."

IOWA

Interprofessional Meeting.—The fifth annual state meeting of the Iowa Interprofessional Association will be held at Des Moines, January 27, with Mr. L. L. Eisentraut, Des Moines, president. Other speakers will be H. D. Bergman, D.V.M., Ames, on "Interprofessional Relations and Cooperation"; Dr. James P. Leake, Washington, D. C., U. S. Public Health Service, encephalitis, and Adolf Eichhorn, D.V.M., Beltsville, Md., director of animal disease station, Bureau of Animal Industry, encephalomyelitis.

Society News.—Dr. M. Herbert Barker, Chicago, discussed hypertension before the Linn County Medical Society in Cedar Rapids, January 8.—Dr. Lester R. Dragstedt, Chicago, addressed the annual dinner of the Bremer County Medical Society in Waverly, December 8, on "Advances in Treatment of Cancer of the Gastrointestinal Tract."—The Cass County Medical Society was addressed in Atlantic, December 19, by Dr. Harry B. Stokes, Omaha, on bronchoscopy.—Dr. Leon S. McGoogan, Omaha, discussed "Operative Office Gynecology" before the Cerro Gordo County Medical Society, December 9.—The Lee County Medical Society was addressed in Keokuk, December 17, by Drs. William W. Heyerdale on "Present Day Management of Varicosities and Stasis Complications of the Lower Extremities"; Jacob A. Bargen, "Regional Enteritis," and Fred Z. Havens, "Malignancies of the Face and Mouth." All are of Rochester, Minn.

KANSAS

Division on Public Health Information.—The Kansas State Board of Health, Topeka, has established a new division on public health information for the extension of lay educational programs pertaining to exhibits, movies, pamphlets, news releases and radio programs on public health. Mr. Roy Oxendale, formerly Topeka representative of the United Press, has been appointed director of the new unit.

Neuropsychiatric Meeting.—The Missouri-Kansas Neuropsychiatric Association met at the Menninger Clinic in Topeka on December 12. The following Topeka speakers participated in a symposium on military neuropsychiatry, which constituted the program:

Dr. William C. Menninger, The Psychiatrist in Relation to the Examining Boards.

Dr. Henry Harlan Crank, Abbreviated Neuropsychiatric Examination for Use in Selective Service Examinations.

David Rapaport, Ph.D., Detecting the Feebleminded Registrant.

Dr. Robert P. Knight, Recognizing the Psychoneurotic Registrant.

Dr. Carl-Gustaf D. Tillman, Recognizing Schizoid and Preschizophrenic Personalities.

Dr. Edward D. Greenwood, Recognizing the Psychopathic Personality.

Dr. Merton M. Gill, Malingering.

Dr. Ernest Lewy, Neuropsychiatric Casualties and Compensation.

Dr. Robert P. Knight, Psychiatric Problems of the Armed Forces in Training and in Combat.

Dr. Lewis L. Robbins, Civilian Morale in Time of War and Preparation for War.

Dr. Alexander R. MacLean, Rochester, Minn., addressed the banquet in the evening on "Postural Psychoneuroses."

LOUISIANA

Portrait of Professor of Surgery.—A portrait of the late Dr. John Smyth, professor of clinical surgery, Tulane University of Louisiana School of Medicine, New Orleans, was unveiled recently in the Hotel Dieu library, which he established. The picture was the gift of Mrs. Jeanne Sully Smyth, widow of the physician. Dr. Smyth was visiting surgeon at Hotel Dieu for more than thirty years. Dr. Daniel J. Murphy, chairman of the hospital board, presided at the ceremonies; guests included Dr. Rudolph Matas.

MASSACHUSETTS

Personal.—Dr. Russell F. Sullivan, Brookline, visiting surgeon to the Boston City Hospital and specialist in orthopedics, has been appointed professor of orthopedic surgery, Tufts College Medical School, Boston. Dr. Sullivan graduated at Tufts in 1918.

Gift of $50,000 to Tufts Medical College.—Two gifts totaling $50,000 to Tufts College Medical School, Boston, have been announced. The Bingham Associates Fund, Bethel, Maine, gave $25,000, and the trustees of a trust for charitable purposes created by William Bingham 2d of Bethel gave the other $25,000. The gifts were designated for the building fund of the school and bring the total to $500,000 in its current compaign for $750,000, newspapers reported.

Health Center at Radcliffe College.—The new Radcliffe College Health Center, Cambridge, is nearing completion. Newspapers reported on December 28 that it will contain twenty rooms with facilities for laboratories, dispensary for students and including living quarters for two nurses and two maids, accommodations for twelve beds with a potential capacity of twenty, to be used for diagnoses and minor illnesses. Serious cases will be treated in Boston and Cambridge hospitals. The center will be headquarters for the annual physical examinations. Dr. Harriet L. Hardy, Cambridge, is college physician.

MINNESOTA

Chiropractor Sentenced.—Edward F. Jacobson, St. Paul chiropractor, pleaded guilty on December 9 to a charge of performing an illegal abortion and was sentenced to not to exceed four years in the state prison. The defendant offered to surrender his basic science certificate and license to practice chiropractic in the state if the court would suspend the sentence and place him on probation. Albin S. Pearson, judge of the district court of Ramsey County, told the defendant that the court could not show him any leniency because he had a previous conviction of practicing medicine without a license that grew out of a similar case.

MISSOURI

Neuropsychiatric Institute.—The fifth interstate neuropsychiatric institute will be held at State Hospital Number 2, St. Joseph, March 22-April 4, under the sponsorship of the American Psychiatric Association through its committee on psychiatric and medical education and financed in part by a grant from the Rockefeller Foundation. Lectures will be presented on neuroanatomy, neuropathology, psychobiology, psychotherapy, neuroroentgenology, neurosurgery and electroencephalography as well as presentations of clinical psychiatric and neurologic problems and related subjects, according to the state medical journal.

NEW YORK

Postgraduate Course.—"The Treatment of Common Diseases" is the theme of a postgraduate course which opened on December 16 for the Schoharie County Medical Society, Cobleskill. The course was arranged by Dr. Clayton W. Greene, Buffalo, under the auspices of the Medical Society of the State of New York. The speakers, all of Buffalo, included:

Dr. Byron D. Bowen, Management of Diabetes with the Newer Forms of Insulin, December 16.

Dr. Abraham H. Aaron, Treatment of Epigastric Distress Following Meals, December 23.

Dr. Frank N. Potts, Treatment of Low Back Pain, December 30.

Dr. Greene, Treatment of Precordial Pain, January 6.

Dr. Earl D. Osborne, Treatment of Common Skin Lesions, January 13.

Dr. Greene, Use of Sulfanilamide and Drugs of That Group, January 20. This lecture is given under the cooperation of the state department of health with the state society.

New York City

Meeting of Chest Physicians.—The New York state chapter of the American College of Chest Physicians will present the following program at the Hotel Biltmore on January 23:

Dr. Louis H. Clerf, Philadelphia, Tracheobronchial Tuberculosis.

Dr. Julian Johnson, Philadelphia, Total Pneumonectomy.

Dr. Samuel J. Kopetzky, Medical Preparedness.

Dr. Henry K. Taylor, Role of the Radiologist in the Diagnosis of Diseases of the Chest.

Dr. Nelson W. Strohm, Buffalo, is president of the state chapter and Dr. Arthur Q. Penta, Schenectady, secretary-treasurer.

Meeting on Hearing Aids.—An open meeting on hearing aids will be held at the Columbia University College of Physicians and Surgeons, January 19, to discuss deafness and hearing aids. Subjects will include "Physical Considerations in the Design of Hearing Aids," "Problems in Fitting Technic" and "The Marketing of Hearing Aids." Included among the speakers will be Drs. Edmund P. Fowler Jr. and Cornelius E. Hagan Jr. on "The Otologist's Responsibility in the Fitting of Hearing Aids."

Medical Research Fund.—Lucius N. Littauer has donated nearly $25,000 in stocks and securities to New York University to establish a medical research fund at the college of medicine, according to the New York *Times*. The money will be used to create the Lucius N. Littauer Fund, the income to be expended "for research in psychiatry, neurology and related fields, in order to increase and diffuse knowledge of the biologic and other factors which influence thought and conduct, and thereby to prevent and correct abnormal human behavior through experimental and clinical approaches." It was also stated that "a fair yet liberal part of the income will be devoted to fellowships for graduate students in medicine of superior ability, to be known as 'Littauer Fellows,' to be trained to practice psychiatry and those branches of medical science concerned with the activities of the mind and the factors influencing it."

Dr. MacInnes Receives Nichols Medal.—The 1942 William H. Nichols Medal of the New York Section of the American Chemical Society has been awarded to Duncan A. MacInnes, Ph.D., since 1926 associate member of the Rockefeller Institute for Medical Research, in recognition of his "outstanding investigations on electrolytes and the development of technics which have immeasurably enriched both the theory and the practice of modern electrochemistry." A statement made by the jury of the award reads in part: "On the basis of these studies the electrode is now a recognized and dependable device which finds wide industrial use. More recently, Dr. MacInnes and his associates at the institute have turned their interest to the motion of biologically important solutions in an electric field, and their experimental investigations in electrophoretic phenomena have greatly increased our knowledge of the protein content of the blood serum." Dr. MacInnes received his Ph.D. at the University of Illinois in 1911.

Record Low Mortality Rate.—A total of 74,553 deaths occurred in the city in 1941, giving a rate of 9.9 per thousand of population, the lowest general mortality rate in the city's history, newspapers reported on January 1. The population was estimated at midyear at 7,521,000. The previous low death rate was 10 in 1938. A new low rate of 30.8 per thousand live births was set for infant mortality, and the maternal mortality rate of 2.2 (247 maternal deaths) per thousand live births is also an all time low rate for the city. The birth rate was 15.2 per thousand of population in 1941. In 1900 the birth rate was 34.5. According to the report, the decrease in deaths from pneumonia in the last ten years has been spectacular and is attributed largely to chemotherapy and serums. In 1941 the mortality rate was 45 per hundred thousand of population against 45.7 in 1940; in 1931 it was 132.2. There were 404 cases of infantile paralysis with eight deaths last year. The last previous epidemic was in 1935, when 2,054 cases and ninety-one deaths were recorded. Typhoid cases totaled 193 with thirteen deaths, which, according to the report, is an "excellent showing" for a city of this size. Twenty-nine of these cases had been imported on refugee ships from Europe. A slight increase in deaths from tuberculosis was noted, 3,365 in 1941 as against 3,323 in 1940, but defense activities were not considered responsible for the rise. Appendicitis deaths totaled 562, giving a rate of 7.5 per hundred thousand of population. This is a new low rate for this disease, but the report states that appendicitis remains a "serious health problem."

OHIO

Changes in Health Officers.—Dr. William E. Sovik has been appointed health officer of Campbell, succeeding Dr. Edward J. Reilly. Dr. Arthur B. Ream, Mechanicsburg, has been appointed health commissioner of Clermont County.

Industrial Physicians' Club.—The Cleveland Industrial Physicians Club was recently formed to exchange views and to study problems in this field, as a result of expanded industrial activities in defense work. Officers are Drs. Rudolph C. Engle, president; Nathaniel M. Jones, vice president, and Richard P. Bell, secretary-treasurer.

Dr. North Retires as Professor.—Dr. Emerson A. North has retired as professor of psychiatry at the University of Cincinnati College of Medicine, effective July 1, 1942. Dr. John Romano, instructor in medicine, Harvard Medical School, Boston, has been named to succeed Dr. North, who is retiring on account of poor health, it is reported. Dr. North has been a member of the Cincinnati faculty since 1923.

OKLAHOMA

Personal.—Dr. Lewis E. Emanuel, Chickasha, was reelected president of the Oklahoma State Hospital Association at the annual meeting in Tulsa, Nov. 14, 1941.——Dr. Lowell L. Stokes, Okmulgee, is to be director of a new health unit in Okmulgee County.

Society News.—The Carter County Medical Society was addressed, November 3, in Ardmore by Dr. Milton J. Serwer and Mr. R. H. Graham, both of Oklahoma City, on "Endocrine Treatment of Abortion" and "The New Reregistration Law and Its Benefits to Both the Medical Profession and the Laity"; Dr. John Hobson Veazey, Ardmore, discussed "Erythroblastosis Fetalis" with report of a case.——Dr. Donald W. Branham, Oklahoma City, addressed the Cleveland County Medical Society, November 13, in Norman on "Injuries of the Urinary Tract."——Dr. Ralph M. Alley, Shawnee, discussed "X-Rays in the Diagnosis of Tuberculosis" before the Pottawatomie County Medical Society, Shawnee, December 20.

PENNSYLVANIA

Society News.—Dr. Theodore O. Elterich, Pittsburgh, discussed "Blood Diseases in Childhood" before the Washington County Medical Society in Washington, January 14.——The Delaware County Medical Society was addressed in Chester, January 8, by Dr. Charles I. Stiteler, Chester, on "Wild Flower Photography in Kodachrome: An Interesting and Educational Hobby."

Philadelphia

Dr. Craig Appointed Director of Chest Clinic.—Dr. Frank A. Craig, assistant professor of clinical medicine at the University of Pennsylvania School of Medicine and the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, has been appointed director of the clinic of the Henry Phipps Institute. According to an announcement, under the new assignment Dr. Craig is responsible for the supervision of the chest clinic of the institute, covering the collapse therapy division of the clinic, the division of public health nursing and the special diagnosis clinic, which has been under his own active direction.

Personal.—Dr. Esmond R. Long, professor of pathology at the University of Pennsylvania School of Medicine and director of the Henry Phipps Institute, recently returned after a three months trip in South and Central America. For two months in Colombia he was consultant to the Junta Construction of the San Carlos Hospital, a sanatorium-hospital to be built on the outskirts of Bogotá. Dr. Long was also in Panama, Venezuela and Costa Rica under the auspices of the Pan American Sanitary Bureau and the division of cultural relations of the U. S. Department of State and lectured before the National Medical Association of Panama, the Medical Association of the Isthmian Canal Zone, the Academy of Medicine and various groups of tuberculosis specialists in Caracas and the faculty of medicine and tuberculosis specialists in San José.——Dr. Louis H. Clerf has been appointed chairman of the Physicians Group of the United Charities Campaign. The appeal of this group will be centered on physicians in central Philadelphia, West Philadelphia and Germantown.

TEXAS

Courses for Continuation of Medical Study.—The Dallas Southern Clinical Society announces its midwinter courses for the continuation of medical study to be held in Dallas, January 26-28. The facilities of the society, the hospitals and clinics of Dallas and the Baylor University College of Medicine will be available. The courses have been designed for the general practitioner and the specialist; physicians who are members of their county medical societies are eligible to attend. The subjects will cover diseases of the chest and medical and surgical diseases of the gastrointestinal tract. Additional information may be obtained from the Secretary, Dallas Southern Clinical Society, 1133 Medical Arts Building, Dallas.

VIRGINIA

Annual Spring Graduate Course.—The sixteenth annual spring graduate course in ophthalmology and otolaryngology will be given at the Gill Memorial Eye, Ear and Throat Hospital, Roanoke, April 6-11. Speakers will include Drs. George E. Shambaugh Jr., Chicago; George M. Coates, Philadelphia; Bennett Y. Alvis, St. Louis; Wendell L. Hughes, Hempstead, N. Y.; Edmund B. Spaeth, Philadelphia, and John R. Richardson, Boston.

WEST VIRGINIA

State Society Announces New Procedure for Annual Meeting.—At a meeting in Bluefield, December 13, the committee on scientific work of the state medical association adopted a new procedure for the program of the seventy-fifth annual session in White Sulphur Springs, July 13-15. All of the section meetings will be abolished, but each section will take over a specified session of the general meeting and conduct a round table presentation of some practical phase of its specialty for the general practitioner. All meetings will be in the nature of round table discussions and the entire program will be designed for the general practitioner. It is believed that the new arrangement will give each section a larger and more important field of service. A national leader in each specialty will be invited to lead the discussion on a specified topic assigned by the program committee, and from two to three section members will be given subtopics to develop following the presentation of the guest essayist. Following this symposium the round table discussion will be conducted.

HAWAII

Emergency Blood Bank.—Newspapers reported on December 24 that between three and four thousand donors had contributed to a blood bank since December 7, the day of the Japanese attack. Plans are under way to accumulate five thousand flasks within two months for use in transfusions.

Dr. Moorhead Honored for Service.—Dr. John J. Moorhead, professor of clinical surgery, New York Post-Graduate Medical School, Columbia University, New York, has been presented with a medal and etching by the Honolulu County Medical Society for his work in helping to care for the wounded following the Japanese attack on Oahu, December 7. Dr. Moorhead was in Honolulu as the guest of the society to deliver a series of twelve lectures when the attack took place. He returned to New York January 8. In a statement to the press, Dr. Moorhead stated that he was on his way to lecture before the Honolulu County Medical Society when he heard the sounds of explosions. "I heard the radio in my car say that the Japanese had attacked, but I went on to the hall and started my lecture," he said. "Then an official of the society came running down the aisle shouting that the Japanese were attacking and that ten surgeons were wanted at the Tripler General Hospital immediately. That was soon after 9 a. m. In twenty minutes I was in the hospital, performing some operations and directing others."

GENERAL

Special Society Election.—Dr. Willis D. Gatch, Indianapolis, was elected president of the Western Surgical Association at its meeting in St. Paul recently. Other officers are Drs. Elmer M. Jones, St. Paul, and E. Eric Larson, Los Angeles, vice presidents; Arthur R. Metz, Chicago, secretary, and Verne C. Hunt, Los Angeles, treasurer. The 1942 meeting will be in Memphis sometime in December.

Time Changed for Defense Health Broadcast.—Announcement is made of the change in time of the round table radio programs known as the National Defense Health Clinics, which are broadcast over the national network of the Mutual Broadcasting System. In the future the time will be 3:45 to 4 p. m. eastern standard time, Sunday afternoons. Mrs. Franklin D. Roosevelt will participate in the program on January 18.

Gallup Survey of Common Colds.—In the one week period ended December 24 a survey by the American Institute of Public Opinion, of which George H. Gallup, Ph.D., Princeton, N. J., is director, found colds reported in one third of American homes, with an estimated total of 18,000,000 persons afflicted, according to the New York *Times*, January 3. More than three million man days of work were lost in war industries or war connected industries from illness during December, and the common cold accounted for half of this lost time, it was stated. In the one week survey, ended December 24, the highest incidence of colds was reported among children under 10 years. Among the 18,000,000 cold sufferers in this period, about one in four was treated by a physician.

Conference on Tomorrow's Children.—At the recent third Southern Conference on Tomorrow's Children in Nashville, approval was given to the organization of a regional committee to coordinate programs and activities in eleven Southeastern states. Membership of the new committee will comprise representatives of the state leagues from Alabama, Arkansas, Florida, Kentucky, North Carolina, South Carolina, Tennessee, Virginia and West Virginia. Georgia and Mississippi, which have no state leagues at the present time, will be represented by selected interested citizens.

Changes in Status of Licensure.—The California State Board of Medical Examiners at a meeting in Sacramento recently took the following action:

Dr. Howard D. Mayers, Fall River Mills, license revoked Oct. 22, 1941, having been charged with habitual intemperance.

Dr. Frederick William Riley, Holy City, license revoked Oct. 23, 1941; charged with aiding and abetting an unlicensed individual, namely William F. Hoque, who operated the Valley Rest Home, Los Gatos, where patients were treated with an escharotic paste in an asserted "cure" of cancer.

Dr. Oscar Charles Long, Brawley, license restored Oct. 21, 1941 and placed on five years' probation without narcotic privileges and ordered to report at each Los Angeles meeting. The license was revoked on March 10, 1938.

Riboflavin Requirement for Enriched Flour Postponed to July 1, 1942.—Federal Security Administrator Paul V. McNutt issued an order, December 3, postponing to July 1, 1942 the effective date of the mandatory riboflavin requirement in the definitions and standards of identity for enriched flour, enriched bromated flour, enriched self-rising flour and enriched farina. All the other provisions of the definitions and standards of identity for these products, published in the *Federal Register* of May 27, 1941, became effective on Jan. 1, 1942. In taking this action Mr. McNutt made the following statement:

A thoroughgoing canvass recently has been made of the present and prospective production of synthetic vitamins, including riboflavin. At the present time the supply of riboflavin, in forms suitable for addition to enriched flour and like products, is not sufficient to permit the production of such foods on a scale which would meet current demands. Riboflavin will become increasingly available in the first half of 1942, and it appears that by July 1 there will be adequate supplies for the enrichment program. In the light of this situation I am postponing to July 1, 1942 the effective date of the mandatory riboflavin requirement in the definitions and standards of identity for enriched flour, enriched bromated flour, enriched self-rising flour and enriched farina.

FOREIGN

Deaths in Other Countries

Dr. Emile de Grósz, emeritus professor of ophthalmology and former dean of the University of Budapest Medical School; honorary fellow of the American College of Surgeons and of the American Academy of Ophthalmology and Otolaryngology; ex-president of the International Organization of the Campaign against Trachoma, died in Budapest, aged 76.——**Dr. Emile-Jean Moure,** clinical professor of otorhinolaryngology, faculty of medicine of Bordeaux University; in 1904 president of the International Congress of Otology at Bordeaux; founder and for a time editor of *Weekly Review of Otology, Rhinology and Laryngology,* died at Cannes on the Riviera, aged 86.

CORRECTION

The Kenny Method.—In the editorial in THE JOURNAL, December 6, a statement was made which indicated that massage was a part of the Kenny technic. Sister Kenny writes to the effect that, according to her concept, the cardinal symptoms of infantile paralysis are "muscle spasm, muscle incoordination and muscle alienation," and that massage does not have any part in her procedure. She states also that "The muscles affected are in spasm, and massage would be damaging as it shortens the muscles affected. Free movement is now allowed until this condition has been rectified and coordination restored. All early movements are carefully guided and controlled by the technician." THE JOURNAL expects to publish in the near future an outline of the technic.

Government Services

New Unit of Gerontology

Nathan W. Shock, Ph.D., assistant professor of physiology, Institute of Child Welfare, University of California, Berkeley, has been appointed senior psychophysiologist in the National Institute of Health of the U. S. Public Health Service, Washington, D. C. According to *Science,* Dr. Shock is to be in charge of the experimental program of the unit on gerontology of the institute, which has established a laboratory in the Baltimore City Hospitals.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 29, 1941.

Satisfactory Report on the Public Health

In the House of Commons Dr. Howitt opened a debate on the health of the people. It was feared that there would be a tremendous number of cases of neurosis from bombing, but such cases have been few. The minister of health, Mr. Ernest Brown, said that, considering the disturbances in life which had taken place, the health of the nation had been surprisingly good. It was bad psychology to be always discussing epidemics except as this led to remedial action. We wanted to make as widespread as possible the services which made for the health of the nation and everywhere to keep the people fighting fit. Much was being done in this field. In the areas to which children have been removed from towns because of the risk of bombing we were providing scores of new sick bays to deal with scabies and impetigo. In regard to the general health, the general death rate was 14.3 per thousand, but that figure was not comparable with the figures of recent years, as noncivilians had been excluded since the outbreak of war. The figure for 1939 was 12.1. The infantile mortality in 1940 was lower than the rate for any year previous to 1938. The maternal mortality rate declined to a new record of 2.61 per thousand labors, against 2.92 in 1939. The conditions of public health remained generally satisfactory. Early in 1940 there was an increase of cerebrospinal fever, but its recurrence had been less noticeable in the early part of this year. The minister of health said he would not cease to look for opportunities in war to find additional services which, when the war was won, would continue the great improvements in progress when it began. He hoped to give in a few weeks a much fuller report on the public health.

INCREASE OF TUBERCULOSIS

A previous minister of health, Mr. Macdonald, claimed that the public health was so good that it showed improvement under war conditions. One exception has to be made, but it is not important. There has been some increase in tuberculosis. In the House of Commons the minister of health stated that on the basis of provisional mortality figures for the years 1939 and 1940 the rate for pulmonary tuberculosis in England and Wales for the population as a whole was 9.7 per cent higher in the latter than in the former years, the highest rate of increase being 15 per cent in females between the ages of 15 and 25 years. In the first quarter of 1941 there was, however, a reduction of 7 per cent for the population as a whole and of 4 per cent for women between the ages of 15 and 25.

This special increase of tuberculosis in young females has led to some comment. In a letter to the *Times* Sir Ernest Graham-Little (dermatologist and member of parliament) states that the total deaths from tuberculosis in females of the ages of 15 to 25 years in 1938, the last prewar year, was 1,761, as against 2,073 in 1940, the latest year for which records exist. The same selective mortality was observed in the last war. Graham-Little states that, although much research was devoted to its explanation, the problem remains unsolved. He says that mortality from tuberculosis is generally accepted as an index to the level of nutrition and submits that one factor in this difference of incidence between men and women may lie in their different dietetic habits. More than one speaker in the debate in the House of Commons pointed out that too many young women are accustomed to make their midday meal of "tea and buns." The latter are made from white flour, which is of negligible nutritive value, consisting almost wholly of starch and stripped of all vitamin content.

Inefficient Steam Sterilization

A case of the rare condition puerperal tetanus was recorded by Maclean and Challen in the *British Medical Journal* (**2**:302 [Aug. 30] 1941). The symptoms began ten days after forceps delivery and suture of the perineum with the silkworm gut. Though a direct smear and culture of vaginal smear was negative for tetanus bacilli, it was concluded that infection took place through the lacerated vaginal tissues. The patient was admitted to the hospital fifteen days after delivery, and no knowledge regarding the asepsis of the obstetric procedure was obtainable. A foul sanguineous vaginal discharge, which appeared on the second day after admission, was considered strong evidence of the site of infection. This case is referred to in an editorial entitled "Inefficient Steam Sterilization" (*ibid.* **2**:445 [Sept. 27] 1941). It is pointed out that Pulvertaft (*ibid.* **1**:441 [Feb. 27] 1937) was able to attribute a case of tetanus after hysterectomy to infection from an unsterilized vaginal pad. This led to the appointment by the Royal College of Obstetricians and Gynecologists of a committee to investigate the possible transmission of anaerobic infections by surgical dressings, with special reference to vaginal pads as a source of tetanus. This committee found that brown cotton wool undergoes no chemical treatment and therefore contains bacteria from the soil in which it was grown. White cotton wool is bleached by boiling in alkali and subsequent treatment with chlorine, which sterilizes it, but after washing in water—a treatment which at the factory investigated loaded it with cocci, owing to the multiplication of these organisms in a softening plant—it is dried in a current of hot air. The blower fans in the premises examined were close to the floor in such a situation as to suck up dust. Cotton wool of course is an excellent filter for particulate matter in air. Sporogenous bacteria were in fact cultivated from all samples examined and the bacillus of tetanus from one. To filter air used for drying or to sterilize the material in bulk in the factory may or may not be possible. If not, cotton wool requires efficient steam sterilization before surgical use. The use of the autoclave in hospitals was found open to criticism. Some of those responsible did not know that overtight packing can prevent adequate penetration by steam, and the technic was unreliable in other ways. The committee recommended loose packing of drums, evacuation to a negative pressure of 20 to 25 inches of mercury, a steam pressure of 20 pounds for twenty minutes and a monthly bacteriologic test with spore bearing anaerobes.

Radium Therapy During the War

The bombing of cities has seriously interfered with radium therapy. The destruction of a radium containing apparatus would be not only a serious loss but a great danger. The scattering of the radium salt might render the locality dangerous for a long time if the salt could not be recovered. Since the outbreak of the war the radium stocks of the London hospitals have been buried in a specially constructed borehole extending to 50 feet below ground. A steel tube 70 feet long extends from outside the teleradium treatment room on the second floor and is sunk in concrete. The radium is kept in a special casket which can be rapidly raised or lowered by a steel hawser operated by a winch and a series of pulleys.

At the Royal Cancer Hospital, London, the use of radium in the form of surface or intravaginal applicators was abandoned temporarily in September 1940 owing to the continuous air attacks, but treatment by teleradium was not interrupted. Treatment of cancer of the skin and uterus was resumed in October, but the use of intrauterine and intravaginal applicators had the difficulty that removal whenever an air raid warning was sounded could not be done in less than two minutes, during which a large quantity of radium would be exposed to danger. To meet this difficulty not more than 90 mg. of radium

was ever left in use during an air raid, and the patient was kept in the safest part of the hospital—the ground floor of a five story ferroconcrete building. The war certainly has had a detrimental effect on radium treatment. Surgery or roentgen treatment had to supplant it to some extent and not with advantage. Also the migration of patients in consequence of air raids, the life in shelters led by many and the bombing of hospitals interfered with their attending hospitals. Also the encouraging increase of cases seen in the early stage received a setback.

BUENOS AIRES

(From Our Regular Correspondent)

Oct. 15, 1941.

Congress of Surgeons of Argentina

The thirteenth Argentine Congress of Surgery was held in Buenos Aires, October 5 to 10. Delegations from Brazil, Chile, Bolivia, Uruguay and Paraguay participated. The chairman, Dr. Arnaldo Caviglia, called attention to the dangers involved in the inadequate surgical training of rural physicians and demanded better training of students.

The first paper, on relapse of umbilical hernias, was given by Dr. Germán Taubenschlag. He designated the constitutional weakness of the wall as the cause of the recurrences. On the basis of embryologic studies and investigations on the physiologic functions of the abdominal muscles, he defended the point of view of the congenital origin of these hernias. Women with this type of hernia require surgical treatment; if they are obese, preliminary reducing treatment should be employed in order to avoid recurrences. In some cases a lipectomy is necessary as a preparatory operation. The speaker recommended transverse elliptic incisions and rejected those which conserve the umbilicus, except in cases in which the hernia is extremely small. Cotton thread is particularly recommended as suture material; it is the best nonresorbable material and causes the least inflammatory reactions. Drainage is to be avoided, even in case of extensive incision. After the operation an adequate rest period is necessary. The patient's constitution, constipation, births and premature getting up are the most important causes of recurrence.

The second paper, on recurrence of inguinal and crural hernias, was presented by Dr. Carlos I. Allende. He designated congenital and constitutional factors as the chief causes of relapse and then evaluated the anatomic and surgical conditions and the operations.

The subject of subphrenic abscesses was reviewed by Dr. Oscar Cames of Rosario. As regards treatment, he recommends the extraserous, particularly the retroperitoneal, approach. He discussed prophylaxis of the abscess, giving attention to disorders that may cause it, that is, appendicitis and gastroduodenal perforation as well as hepatobiliary disorders. It is surprising how rarely these abscesses result from the perforation of a hepatic cyst or an amebic abscess. Diagnostic puncture is not without danger; it can be risked only in special cases and as part of the operation. The prognosis depends largely on early diagnosis. The dangers increase considerably if complications exist.

The paper on the last official subject, traumatic injuries of the menisci and the crucial and lateral ligaments of the patella, was presented by Dr. José Valls.

The final resolutions of the congress stressed the importance of special training in surgery with a corresponding certificate. This is considered indispensable also for the uniform regulation of the hospital career of surgeons.

The subjects planned for the next annual congress are nontraumatic compressions of the spinal cord, injuries of the thorax and acute pancreatitis.

Chilean Congress of Pediatrics

The Chilean Congress of Pediatrics, recently held in Valparaiso, recommended among other things that the Instituto Internacional Americano de Protección a la Infancia should make inquiries regarding nutrition in the different South American countries and suggest ways and means for the exchange of basic foodstuffs. Furthermore, in view of the general political conditions it is suggested to call a Congreso latinoamericano de medicina infantil, which is to meet in Buenos Aires.

The first paper, by Professor Scroggie, was on deficiency symptoms during childhood. These are relatively frequent in Chile. The symptoms are multiform, several of them characteristic for Chile. Pellagra is rarely observed; more frequent are protein, fat and vitamin hunger. Edemas, hyperkeratosis, atrophic skin, hypermelanosis and others are observed. Scroggie described a so-called scratch symptom observed by him: when the nail is drawn over the skin lightly and without pressure, a white line appears, which disappears again after three to twelve hours, whereas normally it should disappear in from fifteen to twenty minutes. At the end of twenty-four hours a crust or a crustlike line, interrupted by parts of normal skin, appears in place of the white line. This sign is caused by the hyperkeratosis, the atrophy of the epidermis and the infiltration of the corium. Many of these children have symptoms of sprue and of gastrointestinal infantilism such as distended abdomen, dolichocolon, dyskinesia of the intestine, profuse foamy stools of grayish white or brownish appearance with large quantities of fatty acids or soaps. In the treatment, blood transfusions or plasma infusions are of decisive effect. Proteins, carbohydrates and vitamins should be given.

Later the congress directed its attention to the problem of the care of prematurely born infants on the basis of 258 who were cared for in the Casa Nacional del Niño from 1931 to 1939. Premature births are caused by social and environmental factors. In the cases examined, causes prevailed which could have been avoided, such as tuberculosis and syphilis in the mother. One fourth of the prematurely born infants showed signs of nonviability; their mortality was one third. Of 130 prematurely born infants that were observed for eight months, 80 per cent had rickets. In the anemia of the prematurely born, the customary therapeutic measures are of no avail. Favorable, rapid and permanent results are obtained with blood transfusions. The total mortality reached 41.4 per cent; by improved care it could be reduced to 20 per cent in 1939. The chief causes of death were intercurrent infections, tuberculosis and syphilis; then followed debility and cerebral and umbilical hemorrhages. During the first two or three months only breast milk was given; however, it should be remembered that there are individual differences in the food requirements.

The third subject was empyema in children. It is most frequent in boys and occurs chiefly during winter; the right half of the thorax is mainly involved. The mortality is greatest in children below 2 years of age.

Marriages

CHARLES E. SAX, Bloomfield, N. J., to Miss Harriet L. Horovitz of Savannah, Ga., in Charleston, S. C., Aug. 28, 1941.

ISADORE JACQUES YETWIN, Waltham, Mass., to Miss Ruth Horowitz of Elizabeth, N. J., in Brooklyn, Dec. 21, 1941.

ALBERT E. ABRAHAM, Arlington, N. J., to Miss Henrietta T. Abrahams of East Orange, N. J., June 22, 1941.

ROBERT BOYD STITH JR., Florence, S. C., to Miss Finley Plunkett of Aiken in December 1941.

CLARENCE VERNARD HODGES, Chicago, to Miss Nelle Mae McAfee of Flossmore, Ill., recently.

BRUNO RIEMER, Romulus, N. Y., to Miss Katharine Koehler of New Rochelle, Aug. 22, 1941.

Deaths

Robert Coalter Bryan, Richmond, Va.; Columbia University College of Physicians and Surgeons, New York, 1899; since 1932 emeritus professor of genitourinary surgery at the Medical College of Virginia; member of the Medical Society of Virginia and of the Southern Surgical Association; past president of the American Association of Genito-Urinary Surgeons; fellow of the American College of Surgeons; served in the regular army during the World War and as a member of the American Red Cross Commission to Rumania; surgeon, Stuart Circle Hospital; member of the House of Delegates of the American Medical Association in 1919; visiting surgeon, Memorial Hospital; at one time one of the owners and chief surgeon at the Grace Hospital; aged 68; died, Dec. 24, 1941.

Charles Clagett Marbury ✠ Washington, D. C.; Georgetown University School of Medicine, Washington, 1893; professor of clinical medicine emeritus at his alma mater since 1925, and from 1904 to 1925 professor of clinical medicine; fellow of the American College of Physicians; veteran of the Spanish-American and World wars; attending physician, Providence Hospital, from 1898 to 1931, chief of staff from 1920 to 1931 and since 1931 member of the consulting staff; since 1928 member of the consulting staff of the Central Dispensary and Emergency Hospital; member of the board of visitors and governors of St. John's College, Annapolis, Md., from Nov. 10, 1924, to March 8, 1938; aged 71; died, Dec. 10, 1941, of coronary thrombosis.

Francis Proctor Field ✠ Surgeon Lieutenant Commander, United States Navy, retired, Parris Island, S. C.; Long Island College Hospital, Brooklyn, 1903; veteran of the Spanish-American War; appointed an assistant surgeon in the naval reserve force in 1917 and was commissioned as a lieutenant in the medical corps of the navy on Aug. 3, 1920; was promoted to the rank of lieutenant commander on June 30, 1931; placed on the retired list Sept. 1, 1940, but remained on active duty at the Marine Barracks; held the Nicaraguan Campaign Medal, the World War Medal and the Spanish-American War Medal for his service in the army; aged 65; died, Dec. 7, 1941, in the United States Naval Hospital of coronary thrombosis.

Loren Bascom Taber Johnson ✠ Washington, D. C.; Georgetown University School of Medicine, Washington, 1900; formerly associate professor of psychopediatrics at his alma mater; veteran of the Spanish-American and World wars; at one time member of the District of Columbia Commission on Mental Health; member of the American Psychiatric Association; past president of the Clinico Pathological Society of Washington and the Washington Nervous and Mental Disease Association; president of the Washington Institute of Mental Hygiene; on the staffs of the Children's Hospital and the Garfield Hospital; aged 66; died, Dec. 14, 1941, in the Emergency Hospital of carcinoma of the stomach.

Lyman Luther Daines, Salt Lake City; Rush Medical College, Chicago, 1931; member of the Utah State Medical Association; dean and professor of bacteriology and pathology at the University of Utah School of Medicine; formerly served as assistant in bacteriology and pathology at the University of Illinois College of Medicine, Chicago; was a special expert for the U. S. Public Health Service; carried on investigations in leprosy and tuberculosis; past president of the Utah Academy of Sciences and the Utah State Public Health Association; formerly member of the city board of health; pathologist, Latter-Day Saints Hospital and the Holy Cross Hospital; aged 58; died, Dec. 12, 1941, of coronary occlusion.

Charles Bradford Sylvester ✠ Portland, Maine; Medical School of Maine, Portland, 1889; past president of the Maine Medical Association, Oxford County Medical Society and the Cumberland County Medical Society; was chairman of the tuberculosis division and past president of the Maine Public Health Association; formerly a member of the board of directors of the National Tuberculosis Association; fellow of the American College of Physicians; served during the World War; was a captain, a major and lieutenant colonel in the United States Army Medical Reserve, retired in 1927; for many years consultant, Maine General Hospital; aged 76; died, Dec. 18, 1941.

Emil Theodor Mueller ✠ North Tonawanda, N. Y.; Universität Heidelberg Medizinische Fakultät, Baden, Germany, 1906; member of the American Society of Clinical Pathologists; medical missionary in Africa from 1909 to 1914; assistant pathologist, New York State Institute for the Study of Malignant Diseases, Buffalo, from 1915 to 1923; pathologist, J. N. Adam Memorial Hospital, Perrysburg, 1923-1924; aged 61; since 1924 pathologist, and past president of the staff of the Deaconess Hospital, where he died, Dec. 17, 1941, of coronary occlusion.

James Joseph Duffy ✠ New York; Harvard Medical School, Boston, 1919; assistant professor of radiology at Cornell University Medical College; member of the American Radium Society; fellow of the American College of Surgeons; associate attending surgeon, Memorial Hospital for the Treatment of Cancer and Allied Diseases; consultant, New York Infirmary for Women and Children, New York, St. John's Long Island City Hospital, Long Island City, and St. Agnes Hospital, White Plains; aged 49; died, Dec. 14, 1941.

Edward Francis Dean, Denver; University of Denver Medical Department, 1897; member of the Colorado State Medical Society; served during the World War; formerly associate professor of clinical surgery at the University of Colorado School of Medicine; fellow of the American College of Surgeons; past president of the Denver County Medical Society; surgeon, St. Luke's, Mercy and Denver General hospitals; aged 67; died, Dec. 4, 1941, of uremia and prostatic obstruction.

Walter Dean Murfin, Decatur, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; member of the Illinois State Medical Society; past president and secretary of the Macon County Medical Society; served during the World War; aged 54; died, Dec. 10, 1941, in St. Mary's Hospital.

Francis Henry Mosse, Tsinan, Shantung, China; L.R.C.P., London, England, M.R.C.S., of England, 1913, and M.R.C.P., of London, England, 1918; representative of the Church of England in the Union work at Cheeloo University; aged 56; died, Dec. 6, 1941, in St. Mary's Hospital, Minneapolis, of pulmonary tuberculosis.

Kenneth Rush Bell, Sanford, Fla.; Emory University School of Medicine, Atlanta, Ga., 1928; member of the Florida Medical Association and the Southeastern Surgical Congress; at one time instructor in gross anatomy and assistant in surgery at his alma mater; aged 39; captain, medical reserve corps, United States Army, stationed at Camp Claiborne, La., where he died, Dec. 4, 1941.

Albert Letherland ✠ Harrisville, N. Y.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1909; formerly county coroner; on the staff of the Lewis County General Hospital, Lowville, and the House of the Good Samaritan, Watertown; aged 61; died in December 1941 of coronary thrombosis.

Walter J. Kurtz, Howard, Pa.; Medico-Chirurgical College of Philadelphia, 1899; member of the Medical Society of the State of Pennsylvania; bank president, member of the county board of health, and school director; aged 65; died, Dec. 2, 1941, of pituitary tumor and myocardial degeneration.

George Arthur Craigin, Swampscott, Mass.; Harvard Medical School, Boston, 1890; member of the Massachusetts Medical Society; clinical instructor in pediatrics at his alma mater from 1903 to 1908; aged 77; died, Oct. 24, 1941, in the New England Baptist Hospital, Boston, of bronchopneumonia.

Lemuel Ira Gist, Coldwater, Mich.; Eclectic Medical College, Cincinnati, 1927; member of the Michigan State Medical Society; veteran of the World War; county coroner; aged 46; died, Dec. 14, 1941, in the Community Health Center of burns received when a boiler exploded in his office.

Mindaugis Vincent Mikolainis, Hartford, Conn.; Columbia University College of Physicians and Surgeons, New York, 1933; member of the Connecticut State Medical Society; attending anesthetist on the staff of St. Francis Hospital; aged 30; died, Nov. 30, 1941, of acute leukemia.

James Percival Morrill ✠ Paterson, N. J.; Yale University School of Medicine, New Haven, Conn., 1901; fellow of the American College of Surgeons; on the staff of St. Joseph's Hospital; aged 65; died, Dec. 14, 1941, of bronchopneumonia following bilateral ureteral obstruction.

William H. Thomas Hamill, Phillipsdale, R. I.; University of Vermont College of Medicine, Burlington, 1899; for many years health officer of the township of East Providence and formerly member of the school committee; aged 68; died, Dec. 3, 1941, of coronary thrombosis.

William A. Curtin, Syracuse, N. Y.; Syracuse University College of Medicine, 1887; member of the Medical Society of the State of New York; professor emeritus of clinical medicine at his alma mater; consulting physician, St. Joseph's Hospital; aged 79; died, Dec. 5, 1941.

Robert Maxwell Franklin ✠ White Plains, N. Y.; University of Tennessee College of Medicine, Memphis, 1925; was on the attending staff in tuberculosis and chest diseases at the Grasslands Hospital, Valhalla; aged 40; died, Dec. 5, 1941, in the Doctors Hospital, New York.

James Francis Dougherty, Richmond Hill, N. Y.; Bellevue Hospital Medical College, New York, 1897; served during the World War; at one time on the staffs of the Mary Immaculate Hospital, Jamaica, and St. Catherine's Hospital, Brooklyn; aged 67; died, Dec. 5, 1941, of chronic myocarditis and nephritis.

James William Morris ✠ Safford, Ariz.; Memphis (Tenn.) Hospital Medical College, 1894; past president and secretary of the Graham County Medical Society; aged 75; attending physician to the Morris-Squibb Hospital, where he died, Dec. 18, 1941.

Samuel Taylor Barton, Canastota, N. Y.; Kentucky School of Medicine, Louisville, 1893; member of the Medical Society of the State of New York; aged 78; died, Dec. 17, 1941, in the Canastota Memorial Hospital of uremia and diabetes mellitus.

Joseph Everett Nobles ✠ Greenville, N. C.; Jefferson Medical College of Philadelphia, 1899; past president of the Pitt County Medical Society; for many years physician for the East Carolina Teachers College; aged 66; died, Dec. 13, 1941.

George M. Case ✠ Elmira, N. Y.; Jefferson Medical College of Philadelphia, 1884; consultant at the Arnot-Ogden Memorial Hospital, St. Joseph's Hospital and the Elmira Reformatory; aged 80; died, Dec. 13, 1941, in Oakland, Calif.

Leander Hugh Conley, Gas City, Ind.; University of Wooster Medical Department, Cleveland, 1883; member of the Indiana State Medical Association; formerly mayor and member of the school board; aged 84; died, Dec. 8, 1941.

Le Roy Downey Howard ✠ Fairmont, W. Va.; Jefferson Medical College of Philadelphia, 1906; fellow of the American College of Surgeons; on the staff of the Cook Hospital; aged 59; died, Dec. 3, 1941, of coronary thrombosis.

Walter Albert Johnson, Antioch, Calif.; Stanford University School of Medicine, San Francisco, 1932; member of the California Medical Association; aged 35; died, Dec. 9, 1941, in the California Sanatorium, Belmont.

Edgar Woods Jr., Williamsburg, Va.; University of Virginia Department of Medicine, Charlottesville, 1885; at one time a medical missionary in China; aged 82; died, Nov. 5, 1941, of cardiovascular renal disease.

Paul Milton Huddleston ✠ Huntington, W. Va.; Tulane University of Louisiana School of Medicine, New Orleans, 1936; director of the county school health program; aged 31; died, Dec. 7, 1941, of pneumonia.

George Bernard O'Connell, Lewiston, Maine; University of Vermont College of Medicine, Burlington, 1904; member of the Maine Medical Association; aged 63; died, Dec. 1, 1941, in St. Mary's General Hospital.

William Grady Smith, Wendell, N. C.; Medical College of Virginia, Richmond, 1925; member of the Medical Society of the State of North Carolina; aged 43; died, Dec. 11, 1941, in the Rex Hospital, Raleigh.

Harris Ainsworth Jacobson, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; physician for the draft board; aged 54; died, Dec. 22, 1941.

J. Park Neal, Kansas City, Mo.; University Medical College of Kansas City, 1907; member of the Missouri State Medical Association; on the staff of St. Joseph Hospital; aged 67; died in December 1941.

Arthur Francis Manning, Waltham, Mass.; Harvard Medical School, Boston, 1928; member of the Massachusetts Medical Society; on the staff of the Waltham Hospital; aged 39; died, Dec. 12, 1941.

Gilbert M. La Salle, Wabash, Ind.; Hahnemann Medical College and Hospital, Chicago, 1895; member of the Indiana State Medical Association; aged 71; died, Dec. 11, 1941, of cerebral hemorrhage.

Thomas J. Edge, Graham, Ky.; Louisville and Hospital Medical College, 1908; member of the Kentucky State Medical Association; aged 60; died, Dec. 10, 1941, in Louisville of coronary occlusion.

Walter English Baker, Arden, N. C.; Chattanooga (Tenn.) Medical College, 1908; member of the Medical Society of the State of North Carolina; formerly county coroner; aged 67; died, Dec. 7, 1941.

Charles Francis McClure, Berlin Heights, Ohio; University of Pennsylvania Department of Medicine, Philadelphia, 1899; aged 69; died, Dec. 8, 1941, in the Cleveland Clinic Hospital.

David Frazer Gurd, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, Que., Canada, 1879; L.R.C.P., London, England, 1879; aged 90; died, Dec. 7, 1941.

Isaac W. Davenport, Sheridan, Ind.; Medical College of Indiana, Indianapolis, 1881; member of the Indiana State Medical Association; aged 83; died, Dec. 4, 1941.

James William Robinson, Winslow, Wash.; State University of Iowa College of Medicine, Iowa City, 1897; aged 75; died, Nov. 17, 1941, of arteriosclerosis.

Rowland McNair Lancaster, Rural Hall, N. C.; North Carolina Medical College, Charlotte, 1914; served during the World War; aged 55; died, Dec. 4, 1941.

John Crawford Burkhalter, Titus, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1892; aged 72; died, Dec. 11, 1941, of coronary occlusion.

Edward H. Brandt, Warrenton, Mo.; St. Louis Medical College, 1888; aged 75; died, Dec. 11, 1941, in the Barnes Hospital, St. Louis, of cerebral embolism.

Osip Raphael Lourie ✠ Boston; University of St. Vladimira Faculty of Medicine, Kiev, Russia, 1896; aged 68; died, Oct. 27, 1941, of coronary thrombosis.

Archibald H. Crouch, Forbus, Tenn. (licensed in Tennessee in 1909); member of the Tennessee State Medical Association; aged 69; died, Dec. 1, 1941.

John Owen Campbell, Lebanon, Tenn.; Vanderbilt University School of Medicine, Nashville, 1878; aged 85; died, Dec. 5, 1941, of heart disease.

Walter Francis Feely ✠ Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1928; aged 38; died, Dec. 3, 1941.

Henry Flowers, Brookhaven, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1891; aged 82; died, Dec. 7, 1941.

Lewis Joel Isaacs ✠ Chicago; College of Physicians and Surgeons of Chicago, 1894; aged 68; died, Dec. 14, 1941, of heart disease.

Anthony Hector Desloges, Montreal, Que., Canada; Laval University Faculty of Medicine, Quebec, 1897; aged 67; died, Dec. 3, 1941.

William Thomas Middlebrooks, Panama City, Fla.; Medical College of Alabama, Mobile, 1886; aged 78; died, Dec. 4, 1941.

John Francis Sullivan, San Francisco; University of California Medical Department, San Francisco, 1900; aged 66; died, Dec. 4, 1941.

Samuel Hirsch ✠ La Salle, Ill.; Jenner Medical College, Chicago, 1898; aged 78; died, Dec. 14, 1941, in St. Mary's Hospital.

Peter Price Denton, Daytona Beach, Fla.; Medico-Chirurgical College of Philadelphia, 1904; aged 75; died, Dec. 6, 1941.

Herschel G. Pugh, Armstrongs Mills, Ohio; Starling Medical College, Columbus, 1900; aged 76; died, Dec. 2, 1941.

Alexander Marion Moore, Athens, Ga.; Leonard Medical School, Raleigh, N. C., 1913; aged 56; died in December 1941.

Louise Josephine Pitcher, Half Moon Bay, Calif.; Cooper Medical College, San Francisco, 1903; died, Nov. 2, 1941.

Alexander Dawson, Atlanta, Ga.; Southern Medical College, Atlanta, 1891; aged 76; died, Dec. 2, 1941.

Clinton Orlando Fuller, Paradise, Calif.; Milwaukee Medical College, 1901; aged 68; died, Dec. 5, 1941.

John R. Keathley, Griffithville, Ark. (licensed in Arkansas in 1903); aged 77; died, Dec. 7, 1941.

Bureau of Investigation

CEASE AND DESIST ORDERS

Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicines or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in circulars, newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission, by virtue of the Wheeler-Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection, even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual, manufacturer or distributor cited is ordered to cease and desist from practices which have been declared objectionable. In some cases the claims cited have been discontinued by the firms several months (or even longer) before the issuance of the order. Abstracts of some of the orders issued in 1941 follow:

Anti-Drink.—Charging that this is not a cure, remedy or competent treatment for alcoholism or the liquor habit and that its use will not eradicate the desire for alcoholic stimulants and that it is not harmless but may result in inflammation of the stomach and intestinal tract and disturbances of the heart and nervous system, the Federal Trade Commission in March 1941 ordered that these misrepresentations be discontinued in the advertising. The defendants in the case were Victoria Chemical Company, Schwarz Druggists, Inc., and Schwarz Drug Stores, Inc., all of Newark, N. J.; Schwarz Drug Company, Bloomfield, N. J.; Hiram Schwarz, Inc., White Plains, N. Y., and a number of Schwarz's, with an Oscar Katz and a Jacob Eisen, all officers of these firms.

Ardanol, Chloro-Zol and Germ-I-Tabs.—These were put out by the American Drug and Chemical Company, Minneapolis, which was ordered in March 1941 by the Federal Trade Commission to desist from advertising: That "Ardanol" is a cure or remedy for sterility in either sex, or will restore or beneficially affect fertility, or possesses any value as a preventive of abortion; that "Chloro-Zol" and "Germ-I-Tabs" have any value in feminine hygiene other than as douches, or that Chloro-Zol is a competent treatment for bromidrosis, tetter, Cuban itch and other cutaneous disorders. Incidentally, back in 1931 the label of Chloro-Zol was declared to bear fraudulent claims in violation of the Pure Food and Drugs Act.

BQR (Beeman's Quick Relief).—The Federal Trade Commission found that this is a laxative with mild analgesic properties and has no curative action on the underlying factors that cause colds. Accordingly, in March 1941 it ordered Beeman's Laboratory, Inc., Atlanta, Ga., and two of its officers and a director to cease representing that the product is a cure or remedy for colds or will prevent these or cold infections; or that it will have any effect on colds in excess of what a laxative and mild analgesic will do. Back in July 1937 this company had signed a stipulation with the Commission, promising to discontinue misrepresentations for BQR as an alleged cure for colds, coughs, asthma and influenza.

Breatheasy.—The Pascal Company, Inc., of Seattle was ordered by the Federal Trade Commission in April 1941 to cease representing this product as a cure, remedy or competent treatment for chronic bronchitis, asthma or hives and other cutaneous disorders, heart trouble, gastric ulcers, neuralgia, neuritis or inflammations in the head, throat and lungs. The concern was also forbidden to run advertisements that fail to reveal that the stuff cannot be safely used by persons having high blood presure, toxic goiter, diabetes or heart trouble. A somewhat similar order was issued by the Commission against the Pascal concern in September 1937.

Certane Products.—These preparations, put out by Rosemarie Lewis, trading as the Certane Company, Los Angeles, consisted of an ointment, a jelly, an antiseptic powder, a douche powder and cones, all sold for feminine hygiene, in connection with appliances known as "Douche Shields," "Applicators," "Dia-Caps" and "Dia-Domes." The advertising represented that if used as directed these products would constitute safe and effective preventives against conception and pregnancy and that they prevent disease and consist in whole or in part of ingredients effective in insuring health and youth to wives and mothers. The Federal Trade Commission found that the preparations and appliances would not accomplish these results and that, in fact, serious injury might result from the use of the Douche Shields under certain conditions. In March 1941 the Commission ordered Miss Lewis to discontinue the misrepresentations.

Claro Hair Remover.—The Claro Laboratories, Inc., South Bend, Ind., was ordered by the Federal Trade Commission in March 1941 to cease representing that this product constitutes a safe or nonirritating means of removing superfluous hair or will permanently remove such hair or retard its growth. The Commission found that because of the barium sulfide and potassium hydroxide in the product its use would dissolve only that part of the hair above the skin and would not affect the root or retard hair growth; that it is not safe or nonirritating and, in fact, is likely to cause severe dermatitis and chemical burns.

Corn-Go and Liquid Corn-Go.—In January 1941 Frank Spors, trading as Spors Company and as Quality Products Company, Le Center, Minn., was ordered by the Federal Trade Commission to discontinue advertisements representing that these products will remove bunions, prevent recurrence of corns or calluses or have any other effect on them than temporary removal.

D. D. D. Prescription.—This has for years been put out as an alleged remedy for eczema by the D. D. D. Corporation, Batavia, Ill. In May 1941 the Federal Trade Commission ordered the concern to cease representing in its advertisements that the product is a cure or remedy for eczema, pimples or hives or has any value in treating these ailments or cutaneous disorders caused by internal or systemic conditions in excess of affording temporary relief from the symptoms of itching; that it has any effect on cutaneous blotches or rashes when due to systemic or constitutional conditions, or athlete's foot, insect bites or ivy and oak poisoning beyond offering temporary alleviation.

Dr. Blanchard's Regulator.—This product, also known as "Dr. Blanchard's Female Compound and Regulator" and "Dr. Jane Blanchard's Compound Regulator," is put out by one Jane Blanchard Geary, trading as Dr. Jane Blanchard, Pittsburgh. In April 1941 Jane Blanchard Geary was ordered by the Federal Trade Commission to discontinue advertisements which represent that her nostrum is a competent regulator of conditions peculiar to women, possesses any value in the treatment of menstrual disorders or is a tonic or a blood purifier or is harmless. She also was ordered to run no advertisements that fail to reveal that her "Regulator" may cause colitis or other serious consequences.

Ethel Bellamy Eyelash Luxuriant.—This was the subject of an order issued by the Federal Trade Commission in May 1941 against Ethel Bellamy, Inc., Nutley, N. J., to cease representing that this preparation has any therapeutic value in the treatment of granulated eyelids, that it promotes eyelash growth, supplies pigment to the eyelashes or darkens them permanently or in any way affects eyelash color, except temporarily through its dyeing properties.

Gland Estemeter.—This device is put out by the Gland Estemeter Corporation of Chicago, which has for its president one William Estep, who has pretended that the thing can be used for diagnosing certain glandular diseases. Estep's fakery was dealt with at length in this department of THE JOURNAL Jan. 21, 1939, page 260. In June 1941 the Federal Trade Commission reported that its findings were that the Estemeter is incapable of detecting or disclosing improper or abnormal function of the glands and possesses no value in diagnosing diseases or conditions of the body, Estep's claims notwithstanding. The Commission, therefore, ordered Estep and his concern to cease representing in the advertising that all ailments or diseases are caused by improper or abnormal functioning of glands; that the respondents' device detects such improper functioning, indicates vitamin deficiencies, discloses whether the condition of the body is acid or alkaline, shows the condition of the blood with respect to energy or activity, analyzes or reveals impairments of the mental processes, and that this device possesses any value in the diagnosis of any ailment or condition of the body.

Gly-Cas.—Medora Whinrey, trading as the Gly-Cas Medicine Company, and the concern's manager, Robert B. Whinrey, Muncie, Ind., were ordered by the Federal Trade Commission in May 1941 to cease and desist from certain advertising misrepresentations. Among these were that the product is a cure or remedy for constipation or affects the condition in any way other than by the temporary relief caused by a partial evacuation of the intestinal tract; that Gly-Cas is a cure or competent treatment for indigestion, bloated or sour stomach, pains of rheumatism or neuritis, kidney disorders, sleeplessness or soreness of muscles, limbs or joints when such conditions are due to causes other than constipation. Back in 1932 the Food and Drug Administration declared that the Gly-Cas label bore fraudulent claims in violation of the Pure Food and Drugs Act. The case was abstracted in this department of THE JOURNAL Aug. 26, 1933, page 725.

Helene Curtis Duchess Machineless Oil Wave, Machineless Oil Solution and Machineless Pads.—The National Mineral Company, trading as Helene Curtis Industries, Chicago, was ordered by the Federal Trade Commission in March 1941 to discontinue advertisements which represent that the cosmetic oil contains properties that will supply nourishment or strength to the hair, cause hair to grow or nourish or invigorate the hair roots or shaft; that it is the original machineless oil wave or that the cosmetic pad contains a thermostatic device or will control or regulate heat or will do more than indicate temperature changes.

Hyral.—This was put out by the Hyral Distributing Company, Wallace G. Clark and Normal A. Dodge of Fort Worth, Texas. In April 1941 the Federal Trade Commission ordered them to cease representing that their product is a new discovery, has germicidal properties, is a cure or remedy for bleeding gums or other mouth disorders beyond its action as a mild antiseptic; that it is a cure or remedy for trench mouth in excess of temporarily inhibiting the growth of the bacteria causing trench mouth; that it has any value in the treatment of pyorrhea or will make gums hard or healthy, prevent loss of teeth, remove tobacco stains or tartar formations or affect unpleasant breath odors except by temporarily masking them.

J. R.—This was advertised by J. R. Olney Sr. and J. R. Olney Jr., trading as J. R. Pharmacal Company, Chester, Pa. In June 1941 the Federal Trade Commission ordered these persons to discontinue certain misrepresentations in their advertising, such as that the product is in all cases a cure or remedy for athlete's foot, affords instant relief from athlete's foot, itching toes, ringworm or raw, inflamed feet in excess of temporarily relieving the symptoms of such conditions, is endorsed by leading health institutions or is the only known treatment of its kind. The order also prohibited advertisements which contain the statement "Athlete's foot fungi killed in less than three minutes in laboratory test," or which otherwise represent that the preparation will, in all cases, kill or destroy the fungi causing athlete's foot.

Menstruaid Nos. 1, 2, 3, 4 and 5.—A. J. Hartig, trading as Hartig Drug Company and H. K. Pharmaceutical Laboratories, Dubuque, Iowa, put out these nostrums. In May 1941 the Federal Trade Commission ordered him to cease issuing advertisements representing that his products constitute a competent treatment for delayed menstruation or that they are scientific, safe and guaranteed. Hartig also was ordered to issue no advertisements that fail to reveal that the use of these products may cause gastro-intestinal disturbances and other serious conditions.

Mi-Vit-Ine, Vi-Min-Ex and Muriel Joan Beautifier.—Exaggerations in the advertising of these came under the Federal Trade Commission's ban in April 1941 when it ordered Fink & Company, Inc., of New York to cease and desist from certain misrepresentations. Among these were that Mi-Vit-Ine is a cure or competent treatment for lowered vigor and vitality, colitis or stomach or nervous disorders; that it is a dietary corrective or is composed of a different kind of wheat germ, or that it has any value in treating alcoholism in excess of stimulating the appetite which may have been affected by reason of overindulgence; that Vi-Min-Ex is a competent treatment for colds, constipation, digestive disorders, neuritis, anemia and some other things or will supply all the minerals and vitamins required by the body, and that the Muriel Joan Beautifier will beautify or transform the face, banish pimples, blackheads and other cutaneous blemishes or have any other permanent effect on kindred conditions.

Mrs. Bee Femo Caps.—In an order issued by the Federal Trade Commission in February 1941, one Carl D. Bates, trading as Simmons Cut Rate Drug Store, Canandaigua, N. Y., was forbidden to advertise in the future that this product, also known as "Femo Caps" and "Bee Caps," is a safe and competent treatment for delayed menstruation. The order also prohibits issuance of any advertising which would fail to reveal that the product might cause gastrointestinal disturbances and other serious conditions. Similar orders were issued in March 1941 against Erie Laboratories, Inc., also trading as Mack Pharmacal Company, and Allied Pharmacal Company, Cleveland; in April 1941 against Sherry's Cut Rate Drug Company, Inc., Bluefield, W. Va., and in May 1941 against the Capital Drug Company, Roanoke, Va.

Natural Mineral Extract.—In May 1941 the Federal Trade Commission ordered the Colonial Drug Company of Tulsa, Okla., and M. A. Younkman, its president, trading also as Colonial Sales Company, to cease and desist from certain misrepresentations in the advertising of this product. Among these were that the thing is a cure or remedy for or possesses therapeutic value in the treatment of eczema, acne, athlete's foot, rheumatism and some twenty-five other ailments; that it possesses germicidal, antiseptic or astringent properties or has value as a tonic or a blood purifier or as a treatment for women's ailments or ill-nourished, backward or defective children.

Neo-Vim (Neo-Vem).—These are names variously given to a preparation put out by the Neo-Vim Company, Columbus, Ohio. In June 1941 this concern was ordered by the Federal Trade Commission to cease representing that the product is a tonic, that its use will supply increased energy or vitality, stimulate the appetite or flow of gastric juices, that it will increase the quantity or improve the quality of the blood and that it constitutes an effective treatment for indigestion or has any therapeutic value other than that of an ordinary laxative.

New Twin-Arc Sun Lamp.—This was claimed by the Health Ray Manufacturing Company, Inc., Deep River, Conn., to provide "4 minutes light equivalent to one hour of sunshine"; to be safe and suitable for home use by laymen for treating diseases without the supervision of a physician; to help build strong bones and teeth, tone up the system, stimulate the glands, improve health and constitute a cure or remedy for athlete's foot, acne, pimples and surface eruptions of the skin. In March 1941 the Federal Trade Commission ordered the Health Ray concern to discontinue these misrepresentations.

Omega Home Use Portable Machine and Mahler Electrolysis Apparatus.—These devices, also known as "Omega Method" and "Mahler Method," are promoted respectively by the Omega Manufacturing Company, Inc., (also called Omega Electrolysis Institute) New York, and the D. J. Mahler Company, Inc., East Providence, R. I. Both devices have been advertised to the public for the self treatment of superfluous hair. In June 1941 the Federal Trade Commission ordered the Omega concern to cease representing that its device is painless, pleasant, quick or easy to use and will have no ill effects on the body. Further, it ordered the Mahler concern to cease representing that its device can be operated with ordinary skill and care. Under their respective orders these concerns were further directed to cease disseminating advertisements which fail to reveal that the use of their devices by persons not trained in the technic of removing superfluous hair from the body by electrolysis may result in permanent disfigurement or cause infections or irreparable injury to health and that these mechanisms should not be used to remove hair from cancerous or syphilitic lesions, pigmented moles or other areas showing local pathologic conditions. Each of the companies had previously been restrained by U. S. district courts on petition of the Commission from disseminating certain advertisements of their devices pending final disposition of the Commission's case against them. Incidentally the Commission, in July 1938, had issued an earlier order against the Mahler firm, directing it to cease representing that its electrolysis device can be used safely by inexperienced operators for the removal of superfluous hair, dark freckles or other cutaneous blemishes.

Petalskin Cosmetics.—These are put out by Petalskin Toiletries, Inc., New York, which concern in May 1941 was ordered by the Federal Trade Commission to discontinue certain advertising misrepresentations. Among these were that "Petalskin Face Cream" penetrates deeply into the pores or cleanses the pores any deeper than their external openings, that the product furnishes nourishment to the skin or supplies "Vitamin F" or has any value in restoring the skin; that "Petalskin Face Tonic" will close or refine the pores of the skin; that "Petalskin Cream Pastelle" will refine or close the pores, correct or remove the cause of enlarged pores or have any effect thereon in excess of removing superficial dirt accumulations; that "Petalskin Face Powder" will not clog the pore openings, or that "Petalskin Hand Cream" will penetrate the skin or counteract aging of the skin.

Phalene and Burtone.—These were put out by a J. H. Camp and Drug Profits, Inc., Ravenswood, W. Va. In March 1941 the Federal Trade Commission ordered the concern to discontinue certain misrepresentations in its advertising, such as that "Phalene" is a liver tonic or is of benefit in preventing premature aging or in removing poisons from the system beyond what an ordinary laxative can do; or that it has any value in treating sick headache, nauseated stomach, aching muscles and joints, run down condition or other disorders in excess of what its laxative action can do. The company further was ordered to cease representing, among other things, that "Burtone" would be of any benefit in bilious attacks, stomach nausea, indigestion or exhaustion beyond giving temporary relief when such conditions are due to constipation.

Princess Pat Cosmetics.—The Federal Trade Commission in May 1941 ordered Gordon-Gordon, Ltd., and its selling agent, Princess Pat, Ltd., Chicago, to cease and desist from making certain misrepresentations in the advertising of these products. Among these were that face powders containing orris root cause pores to clog, irritate the skin and cause roughness, that "Princess Pat Powder" is nonallergic to all persons, will smooth the skin, make it soft or pliant or prevent coarse pores or blackheads; that the concern's "Muscle Oil" and "Princess Pat Irradiated Muscle Oil" will prevent crow's feet, wrinkles or sagging facial muscles or penetrate beneath the skin surface and beneficially affect underlying facial muscles; that "Skin Cleanser" will penetrate beneath the surface or prevent coarse pores, pimples, blackheads or rough skin texture; and that "Skin Food Cream" or "Anti-Wrinkle Cream" will nourish or feed the skin or act as a tonic for the underlying nerves or smooth out or prevent underlying wrinkles. The word "food" also was to be eliminated from the name of any Princess Pat product by the terms of the order.

Re-Duce-Oids.—That this must no longer be represented in advertisements as a safe or effective treatment for obesity was the gist of an order that the Federal Trade Commission issued in May 1941 against the American Medicinal Products, Inc., Los Angeles, and Ernest G. Rurup, its president and directing manager. The order also provided that the advertisements must not fail to reveal that the product should be used only under competent medical supervision, as otherwise it might result in serious and irreparable injury to health, or that the product is definitely harmful if used by persons having diabetes, goiter, tuberculosis, arteriosclerosis or coronary diseases, and that its use over a long period might cause the breaking down of muscular and other tissues, as well as fat tissues, causing nervousness, irritability and increased heart rate, with possible irreparable injury to health even to a normal individual. Re-Duce-Oids was dealt with at considerable length in this department of THE JOURNAL May 1, 1937, page 1557.

Ru-Ex.—In March 1941 the Federal Trade Commission ordered the Ru-Ex Company of St. Paul to cease representing that this nostrum is in all cases safe or harmless and to discontinue any advertising which fails to reveal that the product should not be used by persons having tuberculosis or goiter. The order provides that such advertising need contain only a statement that the preparation should be used only as directed on its label when the label warns that the stuff should not be used by those having tuberculosis or goiter. The Commission pointed out that the product, advertised as a remedy for rheumatism, arthritis and neuritis contains potassium iodide in a quantity sufficient to cause injury to health in some instances if used under conditions prescribed in the advertisements or conditions customary or usual.

Thermo-Magnetic Cushion.—The Chicago Thermo-Magnetic Cushion Company and its president, A. Mercer Parker, were ordered in March 1941 by the Federal Trade Commission to cease and desist from certain misrepresentations in the sale of this device. Among these were that the thing constitutes a cure or remedy for constipation, colds, rheumatism, lumbago, sciatica, menstrual and nervous disorders and some other things; or that it has any value in treating such conditions beyond affording temporary relief from the pains accompanying such conditions when localized in an area affected by heat from such device. The respondents also were ordered to cease representing that the use of the "Cushion" will revitalize the human system. This device was declared fraudulent by the Post Office Department in December 1938 and debarred from the mails. The case was discussed at some length in THE JOURNAL Sept. 9, 1939, page 1051.

Uvursin.—The John J. Fulton Company of San Francisco, distributor, was ordered by the Federal Trade Commission in June 1941 to cease representing that this product has substantial therapeutic value in the treatment of diabetes mellitus and that when used with a diet recommended by the company it substantially increases the efficacy of the diet as a treatment for diabetes. The Commission's findings were that the product does not have the represented efficacy in this disease, as it does not deal with the causes and its use may be definitely harmful to a diabetic person in giving him a false sense of security and thus causing him to delay seeking scientific treatment. The findings further emphasized that the only recognized treatment for diabetes is diet and insulin, adjusted properly to meet the needs of each patient.

Correspondence

SENSITIVITY TO WAR GASES

To the Editor:—I read with keen interest a communication to The Journal, Nov. 29, 1941, page 1879, by Frank B. Queen, M.D., Major, M. C., U. S. Army, and Tom Stander, M.D., Major, M. C., U. S. Army, in which they report a case of severe generalized hypersensitivity to tear gas (CN) considered to be idiopathic. "Of particular interest in the case is the fact that once before the patient had, on transient exposure by passing through a cloud of tear gas during a course of instruction while in the National Guard, experienced itching of the skin which, though remembered seventeen years after the event, was not incapacitating."

Here at Edgewood Arsenal, the center of the Chemical Warfare Service, we have observed that all persons are sensitive to chemical agents when exposed to their effect for the first time. A certain degree of individual variation in sensitivity does occur (as shown by cutaneous tests) regardless of race or color.

It has also been our experience that persons repeatedly exposed to chemical agents such as mustard gas (HS) and, more particularly, tear gas (CN)—for example, plant employees—may in some cases acquire a hypersensitivity which is probably an allergic manifestation. In no case, however, have we noted as severe a general and cutaneous reaction as that experienced by Stander.

Edward F. Lewison, M.D.,
Captain, M. C., U. S. Army,
Edgewood Arsenal, Md.

ACUTE MYOCARDIAL INFARCTION

To the Editor:—The article by Leroy and Snider (The Journal, Dec. 13, 1941, p. 2019) offers convincing experimental proof that ventricular fibrillation is frequently the cause of sudden unexpected death in dogs with coronary thrombosis and myocardial infarction. However, I feel it is not entirely just to develop the therapeutic regimen they have suggested for the treatment of acute myocardial infarction in man.

Some patients with myocardial infarction die of cardiac standstill rather than ventricular fibrillation (Grieco, E. H., and Schwartz, S. P.: *Am. Heart J.* **16**:595 [Nov.] 1938). There are a number of additional reasons why I think the routine intravenous administration of theophylline with ethylene diamine (aminophylline) and atropine is inadvisable.

The value of theophylline with ethylene diamine or the other so-called coronary vasodilators in the treatment of coronary artery disease is still a very debatable topic. Furthermore, ventricular fibrillation may occur on the fourteenth day following an acute myocardial infarction as well as on the first or second day, so that the suggested treatment would have to be given for that length of time. I believe a patient with an acute myocardial infarct should have as little intravenous medication as possible. An intravenous injection is not an entirely innocuous procedure in a patient with severe myocardial disease and should be avoided wherever possible. Dr. Harold Goldburgh and I have seen at least 2 cases in which we believe sudden unexpected death was due to the intravenous administration of theophylline with ethylene diamine.

One other objection can be raised to this therapy. The authors state that "if the same ratio observed in dogs should hold for human beings, one of three will die instead of three of four" with this mode of treatment. The various published statistics on the mortality of acute myocardial infarction present figures from 8 to 50 per cent. Most of the recent data give an average mortality for all attacks of about 35 per cent. In work now in progress my associates and I have found similar mortality rates. If one out of three is the average mortality in human beings (and Masters has given a death rate as low as 8 per cent for initial attacks) the plan of therapy given by Leroy and Snider would offer little improvement over our present death rate.

Samuel Baer, M.D., Philadelphia.

FALLING DROP METHOD FOR SPECIFIC GRAVITY

To the Editor:—In recent years much interest has developed in the clinical applications of the falling drop method for specific gravity, the chief of which were first pointed out by us in The Journal, Jan. 8, 1927, page 91. Their usefulness has been recognized in large measure because of the notable studies of shock by Dr. John Scudder.

Clinical interest in the densiometric method has led to the appearance in the literature of a considerable number of so-called "improvements." Modifications of the method, deriving from various sources, are leading to its abuse by the employment of procedures which detract from its sensitivity.

Alluring suggestions, such as "elimination of standards and nomograms," militate against the accuracy of the method. Standard drops of pure potassium sulfate solutions are of constant composition and eliminate the vagaries due to the use of oils as the medium through which the drops fall. Vagaries occur not only because of the variability of all such oils under different conditions of temperature but also because these oils themselves, no matter how "standardized," change their physical properties gradually by such unavoidable factors as evaporation. We went through this immature procedure ourselves, as is shown by our preliminary paper (Blood Specific Gravity: Its Significance and a New Method for Its Determination, *Am. J. Physiol.* **69**:654 [Aug.] 1924). Retrogression can hardly be considered an improvement.

Tables of questionable accuracy have appeared to replace the alinement chart. Allegedly simpler, such tables also require the application of a formula. Of the published tables at least one is grossly inaccurate.

For those who object to the use of an alinement chart we suggest the use of a single simple formula, as follows:
Log. $Y = 3.9155 + 0.00267\ T - (1.2953 + 0.0054\ T)$ log. X
where X = seconds, T = °C and Y = required density difference.

Besides covering all possible determinations by the alinement chart, this formula can be used for drops which require longer than one hundred seconds to fall.

As other examples of false "improvement" may be cited reduction in the length of the drop fall, which decreases sensitivity in proportion to the amount of the reduction; also the use of oils exhibiting viscosity above that of xylene and brombenzene mixtures tends to detract from sensitivity.

Editors accepting alleged "improvements" of methods should, where possible, protect themselves against acceptance of inferior and not altogether harmless material by consulting the original authors. At the side of the "patent medicine racket" and "quack physiotherapy" has arisen the "distorted method" racket!

We hope that this warning against imitations of the falling drop method, hitherto best described by those who toiled over its induction (Barbour, H. G., and Hamilton, W. F.: The Falling Drop Method for Determining Specific Gravity, *J. Biol. Chem.* **69**:625 [Aug.] 1926), will be appreciated by all workers who may have been, or may in future be, misled.

Henry G. Barbour, M.D.,
Yale University, New Haven, Conn.

William F. Hamilton, Ph.D.,
University of Georgia, Augusta.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, January 10, page 165.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 16-18. Acting Sec., Dr. B. F. Austin, 519 Dexter Ave., Montgomery.

ARKANSAS: * *Medical.* Little Rock, June 4-5. Sec., Dr. D. L. Owens, Harrison. *Eclectic.* Little Rock, June 4-5. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CONNECTICUT: * *Medical. Examination.* Hartford, March 10-11. *Endorsement.* Hartford, March 24. Sec. to the Board, Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, March 10-11. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: Dover, July 14-16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: * Jacksonville, June 22-23. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

ILLINOIS: Chicago, Jan. 20-22. Superintendent of Registration, Mr. Philip M. Harman, Department of Registration and Education, Springfield.

INDIANA: Indianapolis, June 16-18. Sec., Board of Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Kansas City, June 16-17. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

MAINE: Portland, March 10-11. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, March 10-13. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: * Ann Arbor and Detroit, June 10-12. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: * Minneapolis, Jan. 20-22. Sec., Dr. Julian F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MONTANA: Helena, April 7-8. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEVADA: *Reciprocity.* Carson City, February 2. Sec., Dr. Frederick M. Anderson, 215 N. Carson Street, Carson City.

NEW HAMPSHIRE: Concord, March 12-13. Sec., Dr. T. P. Burroughs, Board of Registration in Medicine, State House, Concord.

NEW JERSEY: Trenton, June 16-17. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: * Santa Fe, April 13-14. Sec., Dr. Le Grand Ward 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 26-29. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, State Education Department, 315 Education Bldg., Albany.

OREGON: Portland, Jan. 21-23. Exec. Sec., Miss Lorienne M. Conlee, 608 Failing Bldg., Portland.

SOUTH DAKOTA: * Pierre, Jan. 20-21. Dir., Medical Licensure, Dr. J. F. D. Cook, State Board of Health, Pierre.

TEXAS: Galveston, March 23-25. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas.

VERMONT: Burlington, Feb. 10-12. Sec., Board of Medical Registration, Dr. F. J. Lawliss, Richford.

WEST VIRGINIA: Charleston, March 2-4. Commissioner, Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WYOMING: Cheyenne, Feb. 2-3. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

COLORADO: Denver, March 10-11. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver.

CONNECTICUT: Feb. 14. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, April 20-21. Sec., Commission on Licensure, Dr. George C. Ruhland, 6150 E. Municipal Bldg., Washington.

FLORIDA: Gainesville, June 8. Sec., Professor J. F. Conn, John B. Stetson University, De Land.

MICHIGAN: February 13-14. Sec., Miss Flora E. Dube, East Lansing.

NEW MEXICO: Albuquerque, Feb. 2. Sec., Miss Pia Joerger, State Capitol, Santa Fe.

OREGON: Portland, Feb. 14. Applications must be on file not later than than Jan. 28. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Feb. 18. Chief, Division of Examiners, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

Nevada Reciprocity Report

The Nevada State Board of Medical Examiners reports 2 physicians licensed to practice medicine by reciprocity on August 4. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Illinois College of Medicine		(1941)	Illinois
McGill University Faculty of Medicine		(1940)	California

Colorado October Report

The Colorado State Board of Medical Examiners reports the written examination for medical licensure held at Denver, Oct. 8-10, 1941. The examination covered 8 subjects and included 64 questions. An average of 75 per cent was required to pass. Six candidates were examined, 4 of whom passed and 2 failed. Five physicians were licensed to practice medicine by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Colorado School of Medicine		(1940)	1
Rush Medical College		(1941)	1
University of Tennessee College of Medicine		(1940)	1
Osteopath *			1

School	FAILED	Number Failed
Osteopaths *		2

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Rush Medical College		(1937)	Illinois
University of Kansas School of Medicine		(1930)	Kansas
University of Nebraska College of Medicine		(1922)	N. B. M. Ex.
Duke University School of Medicine		(1938)	N. B. M. Ex.
University of Oklahoma School of Medicine		(1938)	Oklahoma

* Examined in medicine and surgery.

Washington July Report

The Washington State Board of Medical Examiners reports the examination for medical licensure held at Seattle, July 21-23, 1941. The examination covered 7 subjects and included 70 questions. An average of 60 per cent in each subject was required to pass. Forty candidates were examined, all of whom passed. Thirty-seven physicians were licensed to practice medicine by reciprocity and 9 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
College of Medical Evangelists		(1941, 3)	3
Loyola University School of Medicine		(1941, 3)	3
Northwestern University Medical School		(1939), (1941)	2
Rush Medical College		(1937), (1940, 2)	3
Uniyersity of Chicago, The School of Medicine		(1939)	1
University of Illinois College of Medicine		(1940), (1941)	2
University of Kansas School of Medicine		(1940)	1
University of Louisville School of Medicine		(1939), (1940)	2
Harvard Medical School		(1940)	1
Washington University School of Medicine		(1940, 2)	2
Creighton University School of Medicine		(1940, 2)	2
Columbia University College of Physicians and Surgeons		(1937), (1939)	2
Cornell University Medical College		(1923)	1
Western Reserve University School of Medicine		(1935)	1
University of Oklahoma School of Medicine		(1940)	1
University of Oregon Medical School		(1940, 7)	7
Jefferson Medical College of Philadelphia		(1926)	1
University of Toronto Faculty of Medicine		(1937), (1939)	2
McGill University Faculty of Medicine		(1939), (1940)*	2
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg		(1934)	1

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1940)	California
Northwestern University Medical School		(1937)	Tennessee, (1939) California
Rush Medical College		(1929), (1936)	Montana, (1939) Missouri
University of Illinois College of Medicine		(1937)	Colorado
State University of Iowa College of Medicine		(1940)	Iowa
Louisiana State University School of Medicine		(1940)	California
Johns Hopkins University School of Medicine		(1935)	Maryland
Boston University School of Medicine		(1924)	Vermont
University of Michigan Medical School		(1937), (1940)	Michigan
University of Minnesota Medical School		(1923), (1927)	Minnesota
St. Louis University School of Medicine		(1931)	Missouri
Washington University School of Medicine		(1939, 2)	Missouri
University of Nebraska College of Medicine		(1909), (1937), (1940, 2)	Nebraska
University of Oklahoma School of Medicine		(1937), (1940)	Oklahoma
University of Oregon Medical School		(1928), (1933), (1935), (1938), (1939)	Oregon, (1934) Utah, (1937) Wisconsin
University of Pennsylvania School of Medicine		(1930), (1934	Pennsylvania
Baylor University College of Medicine		(1926)	California, (1934) Wiconsin
University of Wisconsin Medical School		(1932)	Wisconsin, (1937) Michigan

School	LICENSED BY ENDORSEMENT	Year Grad.
College of Medical Evangelists		(1938)
Northwestern University Medical School		(1934)
The School of Medicine of the Division of the Biological Sciences		(1933)
Harvard Medical School		(1936), (1940)
University of Oregon Medical School		(1940)
McGill University Faculty of Medicine		(1937, 2)
Medizinische Fakultät der Universität Wien		(1937)

* License has not been issued.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Evidence: Communications Between Workmen's Compensation Claimant and Examining Physician Not Privileged.—Information, the court of appeals, Franklin County, Ohio, holds, obtained by and the diagnosis made by a physician who on the request of the industrial commission examines a claimant for compensation under the Ohio workmen's compensation act to determine if the disability involved is connected with an industrial accident is not privileged under the Ohio statute which makes privileged a communication made to a physician "in that relation, or his advice to his patient." The testimony of such a physician as to his diagnosis of the claimant's condition is admissible in a proceeding to recover compensation instituted by the claimant. For a communication to qualify as privileged under the statute, said the court, it must not only appear that the evidence presented the relation of physician and patient but also that any communication made was "in that relation." In the opinion of the court it could not be said that, where a physician examines a claimant for the purpose of ascertaining conditions determinative of a fact essential to a cause of action, the physician has received a communication in the relation of physician and patient.—*McMillen v. Industrial Commission of Ohio, 37 N. E. (2d) 632 (Ohio, 1941).*

Medical Practice Acts: Revocation of License to Practice Physiotherapy.—The medical practice act of New York provides for the licensing of both physiotherapists and practitioners of medicine. The provisions of the act relating to the revocation, suspension or annulment of licenses, however, refer only to practitioners of medicine. If "a physician has been convicted in a court of competent jurisdiction, either within or without this state, of a crime," disciplinary action is authorized. In 1930 the plaintiff was granted a license to practice physiotherapy in the state of New York; in 1936 the Regents of the University of the State of New York revoked that license on proof that the plaintiff had been convicted of a crime. From such action by the Board of Regents, the plaintiff appealed to the supreme court, special term, Ulster County, New York.

The plaintiff contended that the disciplinary provisions of the medical practice act had no relation to physiotherapists but were applicable only to practitioners of medicine. The evidence showed that the plaintiff had been properly notified of the hearing before the Medical Committee on Grievances and that the same formal procedure required to hear and determine charges of unfitness against a physician was applied to the plaintiff. The supreme court held that, since the Regents were authorized to grant the plaintiff a license, they were likewise authorized, in their supervisory capacity, to revoke that license for proper and sufficient cause. The order revoking the plaintiff's license to practice physiotherapy was accordingly confirmed.—*Swift v. Graves, Commissioner of Education, et al., 19 N. Y. S. (2d) 686 (New York, 1940).*

Medical Practice Acts: Suspension of License for Use of Quack Methods of Diagnosing.—The defendant had been licensed to practice medicine in the state of Minnesota. After entering into active practice he was twice warned by the state board of medical examiners that some of his conduct was not strictly scientific. At length one of his former patients filed a complaint before the board charging that the defendant conducted himself in a manner unbecoming to persons licensed to practice medicine and that certain methods of diagnosis used by the defendant were improper and unprofessional. On the basis of the evidence presented, the board suspended the defendant's license to practice medicine for a period of five years. From an order of the district court dismissing an appeal from the board's ruling, the defendant appealed to the Supreme Court of Minnesota.

The defendant himself described his method of diagnosis. A piece of wood pulp paper, moistened by the patient's own saliva, was placed on a selected spot on the patient's abdomen and apparently produced some "line on the person's abdomen." Different drugs were then placed in the patient's hand—"left hand for female and right hand for the male." If the drug or medicine which the patient held was the one which would effect a cure, or the one most likely to do so, some reaction, apparent to the defendant, would result from the paper on the patient's abdomen and the line on the patient's abdomen would "go down deeper, three or four finger breadths deeper." In this manner the defendant was able to determine the proper type of medication. He further frankly testified that his method of diagnosis was "fairly dependable" without his having to see or examine the patient. All he needed was the test paper, moistened by the patient's tongue. This paper would be mailed to him, placed on another person's abdomen and different drugs placed in the "subject's" hand. The diagnosis would then be made according to reactions apparent to the defendant. Absentee patients invariably received pills or pellets compounded entirely of sugar and milk. According to the defendant's testimony these pills received their therapeutic potency from "energy" with which he charged them from a machine with a certain "hook-up." There was no attempt by the defendant to justify his habitual methods of diagnosis and treatment on any scientific basis.

The defendant first contended that the proceedings before the board constituted a denial of due process or equal protection of the law because the board acted as both prosecutor and judge. The Supreme Court found that the defendant had been given ample notice of the charges against him and had been heard at great length in his own behalf. Furthermore, the whole proceeding before the board had been subjected to review by the district court. The contention was therefore overruled.

The defendant also contended that he had been denied the privilege of introducing the testimony of three witnesses in his behalf. These witnesses had been present at the hearing but had left prior to its conclusion. The board refused an adjournment in order to take their testimony. The witnesses were all laymen, and the defendant made no offer of proof to show how their testimony would have benefited him, except to indicate that they had been successfully treated. However, the court said that the defendant's diagnostic methods were "so clearly bald quackery, and so much an imposition on his patients, that the testimony of 3 patients with whom he had had good luck would not have helped him." In conclusion the court said that it was impossible to hold for the defendant "until the methods of the aboriginal medicine men, the witch doctor, and voodooism are demonstrated to be superior to those of modern science as applied in the field of medicine. The board of seven competent doctors adhered to the notion that the accomplishments of biochemistry and microscopy, with their diagnostic disclosures (which in many cases go to the point of demonstration) are superior to quackery, ancient and modern." The board's order was therefore affirmed. A petition for a writ of certiorari was denied by the United States Supreme Court.—*Minnesota State Board of Medical Examiners v. Schmidt, 292 N. W. 255; 61 S. Ct. 135 (Minn., 1940).*

Society Proceedings

COMING MEETINGS

Annual Congress on Medical Education and Licensure, Chicago, Feb. 16-17. Dr. William D. Cutter, 535 North Dearborn St., Chicago, Secretary.

American Orthopsychiatric Association, Detroit, Feb. 19-21. Dr. Norvelle C. LaMar, 149 East 73d St., New York, Secretary.

Central Surgical Association, Chicago, Feb. 27-28. Dr. George M. Curtis, Ohio State University, Columbus, Ohio, Secretary.

Pacific Coast Surgical Association, San Francisco and Del Monte, Calif., Feb. 17-20. Dr. F. L. Reichert, Stanford University Hospital, San Francisco, Secretary.

Society of Surgeons of New Jersey, Trenton, Jan. 28. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

62:909-1128 (Nov.) 1941

*Stature and Weight of Children of United States, with Reference to Influence of Racial, Regional, Socioeconomic and Secular Factors. H. V. Meredith, Iowa City.—p. 909.

*Intradermal Immunization: III. Typhoid Fever. D. W. Van Gelder, Chicago, and S. Fisher, Fort Sheridan, Ill.—p. 933.

Vaginal Flora in Children. Grace Campbell Hardy, New York.—p. 939.

Influence of Diet on Uric Acid Excretion of Young Children. Jean E. Hawks and Gladys Everson, East Lansing, Mich.—p. 955.

Basal Metabolism of Normal Infants from Three to Fifteen Months of Age, with Special Reference to Twins. Dorothy D. Clagett and Millicent L. Hathaway, Ithaca, N. Y.—p. 967.

Physical and Chemical Properties of Sputum: I. Factors Determining Variations in Portions from Different Parts of Tracheobronchial Tree. F. P. Basch, P. Holinger and H. G. Poncher, Chicago.—p. 981.

Incidence and Nature of Fetal Arrhythmias. L. W. Sontag and Helen Newbery, Yellow Springs, Ohio.—p. 991.

School Health Service and the Private Physician. A. H. Kantrow, New York.—p. 1046.

Communicable Disease and the School. G. M. Wheatley, New York.—p. 1052.

Rural Communicable Disease Programs. M. R. Kinde, Battle Creek, Mich.—p. 1060.

Stature and Weight of Children.—In determining the average stature and weight of boys aged 9 to 14 years in the United States Meredith finds that boys living in the United States today, white and Negro, are 6 to 8 per cent taller and 12 to 15 per cent heavier than they were half a century ago. White boys of families of the professional and major managerial classes are 3 per cent taller and 6 per cent heavier than those of families of the unskilled and semiskilled classes. Boys in the United States of various ethnic groups in no instance appear to differ in average stature by more than 2 inches (5 cm.). The accessible averages for weight fluctuate so that a reasonable estimate of the maximal difference is precluded. Averages for stature and weight vary but slightly for white boys residing in different parts of the United States.

Intradermal Immunization.—Van Gelder and Fisher compared the intradermal and subcutaneous methods of typhoid vaccination by giving 285 children three injections of typhoid vaccine subcutaneously and 295 three injections intradermally. The vaccine used contained 1,000,000,000 typhoid bacilli in 1 cc. The first group were given 0.5, 1 and 1 cc. of the vaccine. The respective doses for the other group of children who were subdivided into three subgroups were: 0.05, 0.1 and 0.1; 0.05, 0.1 and 0.15, and 0.1, 0.15 and 0.2 cc. Forty-eight of the children who received the typhoid vaccine subcutaneously had some systemic reaction after at least one injection, usually the first. Sore arms were complained of after eighty-six injections and tender regional adenitis after seven. No significant difference in the subsequent agglutinin titer of the blood was observed whether the vaccine was given at intervals of two or three weeks. No somatic, or O, agglutinin appeared in the blood of 103 children; a titer of 20 developed in 5, of 40 in 1, of 80 in 6 and of 160 in 170. The flagellar, or H, agglutinin titer was negative for 1, 320 for 4, 640 for 262 and 1,280 for 18. Only 8 of the 295 children given the vaccine intradermally experienced any systemic mild reaction; most of them were among the subjects of the third subgroup. Somatic, or O, agglutinins were not stimulated to any considerable degree by the intradermal injections, but the three doses given the second subgroup or those given the third subgroup increased the flagellar, or H, agglutinin titers to levels about as high as those obtained by the subcutaneous method. Despite the fact that O agglutinins are stimulated by the intradermal method, the authors believe that the method is satisfactory, because reactions are practically eliminated and the difference between the agglutinin titers of the two methods does not seem highly significant. The three doses most satisfactory for intradermal injection for subjects weighing 120 (54.5 Kg.) or more pounds are 0.05, 0.1 and 0.15 cc., because the reactions after this dosage are minimal and there is no significant lowering of the subsequent agglutinin titers.

American Journal of Medical Sciences, Philadelphia

202:625-780 (Nov.) 1941

Some Medical, Social and Economic Problems of the Physically Handicapped. A. R. Shands Jr., Wilmington, Del.—p. 625.

*Werner's Syndrome: Report of First Necropsy and of Findings in New Case. B. S. Oppenheimer and V. H. Kugel, New York.—p. 629.

Hamilton-Schwartz Test and Hyperparathyroidism in Various Diseases. N. J. Winer, New York.—p. 642.

Note on Effect of Dermal and Enteral Irradiation by Radio Phosphorus on Blood Levels of Dogs. L. A. Erf, Berkeley, Calif.—p. 650.

Defect in Clot Formation Observed in Three Cases of Chronic Agnogenic Hemorrhagic Disease. G. Carpenter and J. G. Allen, Chicago.—p. 655.

*Idiopathic Hypoprothrombinemia—Apparently Unrecorded Condition. J. E. Rhoads and T. Fitz-Hugh Jr., Philadelphia.—p. 662.

Intraventricular Block, Including So-Called Bundle Branch Block. A. Bohning, L. N. Katz, R. Langendorf and B. Blumenthal, Chicago.—p. 671.

Phonograph Records of Heart Sounds, Murmurs and Arrythmias. G. D. Geckeler, Philadelphia.—p. 685.

Simple Micro Test for Sulfanilamide and Its Derivatives in Blood. J. Churg and D. Lehr, Newark, N. J.—p. 687.

Effect of Low Calcium Diet and Calciferol (Vitamin D_2) on Calcium and Phosphorus Metabolism: Studies on Two Parathyroprivic Patients and One "Normal" Subject. E. Rose, W. H. Perloff and F. W. Sunderman, Philadelphia.—p. 691.

*Further Experience with Use of Guanidine Hydrochloride in Treatment of Myasthenia Gravis. Katharine Dodd, S. S. Riven and A. S. Minot, Nashville, Tenn.—p. 702.

Primary Carcinoma of Liver in Hemochromatosis. J. E. Berk and M. M. Lieber, Philadelphia.—p. 708.

Water Metabolism in Pregnancy. W. T. Pommerenke and H. E. Thompson Jr., Rochester, N. Y.—p. 714.

*Effect of Alcohol on Vision. H. Newman and E. Fletcher, San Francisco.—p. 723.

Diabetic State as Influenced by Diet. Anna R. Spiegelman and H. O. Mosenthal, New York.—p. 731.

Angina Pectoris in Young Individuals with Aortic Insufficiency: Report of Six Cases. A. C. Ernstene and R. W. Schneider, Cleveland.—p. 737.

Werner's Syndrome.—Oppenheimer and Kugel discuss the data of the first necropsy of a patient with Werner's syndrome. The observations at necropsy, they say, confirmed the clinical evidence of endocrine stigmatization: atrophy of the testes and the prostate gland, adenomas of the thyroid and adrenal and evidence of hyperactivity of the parathyroid. The pituitary gland showed no abnormalities. They enumerate the following as clinical evidences of parathyroid hyperactivity: generalized and localized osteoporosis, metastatic calcification, transient and recurrent hypercalcemia, abnormal negative calcium balance and increased circulation of the parathyroid secretion.

Idiopathic Hypoprothrombinemia.—The unexpected finding of a prothrombin deficiency in a white youth of 18 with supposed hemophilia led Rhoads and Fitz-Hugh to study the defects of the coagulability of this patient's blood more carefully. The prothrombin time was definitely prolonged. The diagnosis, during fifteen previous admissions to the hospital, had always been hemophilia. Because of the hypoprothrombinemia the diagnosis of hemophilia was abandoned and that of idiopathic hypoprothrombinemia was substituted. Because of the early onset of symptoms, the condition may have been congenital. The family history was negative, and the plasma prothrombin concentration of the patient's mother and brother was normal. The disease differed from typical hemophilia in that clot retraction was poor. None of the tests of hepatic function revealed any evidence of hepatic damage. At necropsy no gross hepatic abnormality was discernible, and the microscopic changes were much less than those found in patients with hypoprothrombinemia due to hepatic damage. The possibility of a toxic agent which destroyed prothrombin directly seems unlikely, as the patient did not improve with changes in diet and environment.

Neither a disorder of the digestive tract nor failure to absorb vitamin K were factors in the patient's illness. The studies carried out indicate that his coagulation defect was due to a lack of prothrombin and to a qualitative defect in fibrinogen without a quantitative defect.

Guanidine Hydrochloride in Myasthenia Gravis.—On the basis of the results that Dodd and her associates obtained with guanidine hydrochloride in 6 patients with myasthenia gravis and those obtained in 21 cases by other workers the authors conclude that the drug causes temporary improvement in muscular function in most patients with the disease. These patients have an increased tolerance to guanidine. Prolonged medication produces sustained improvement without harmful effects. Generally less of the drug is required after several months of adequate individual medication. Guanidine, unlike prostigmine, does not inhibit the activity of choline esterase. It may play a fundamental part in restoring irritability to cells.

Effect of Alcohol on Vision.—Newman and Fletcher studied the affect that alcohol had on the vision of 35 men and 15 women drivers after they had consumed within fifteen to thirty minutes at least 1 ounce (30 cc.) of whisky to each 30 pounds (13.6 Kg.) of body weight. Seven tests (for visual acuity, depth perception, distance judgment, lateral fields of vision, eye coordination, glare resistance and glare recovery) were given the subjects prior to their ingestion of the whisky and again forty-five minutes after its consumption. The alcohol produced changes in all the components of vision tested but not all the components of all the persons tested were affected. Although there was an obvious tendency for persons with higher concentrations of alcohol in their blood (which varied from 58 to 218 mg. per hundred cubic centimeters) to show more changes, particularly major changes, this was far from true in every instance. From the data it is impossible to select any single concentration as a criterion of dangerous intoxication. The figure of 150 mg. per hundred cubic centimeters proposed as prima facie evidence of drunkenness by the National Safety Council, would be too high for some subjects and too low for others. In every volunteer with a concentration of more than 115 mg. of alcohol per hundred cubic centimeters of blood there was a significant change in at least one of the tests performed. The greatest number of changes occurred in visual acuity, the smallest in the field of vision.

American Journal of Ophthalmology, Cincinnati

24:1233-1348 (Nov.) 1941

Clinical Ocular Conditions Associated with Vitamin B Complex Deficiencies. L. V. Johnson, Cleveland.—p. 1233.
Sensitivities of Color Receptors as Measured by Dark Adaptation. J. Mandelbaum and Esther U. Mintz, New York.—p. 1241.
Physiologic Studies on Neural Mechanisms of Visual Localization and Discrimination. S. A. Talbot and W. H. Marshall, Baltimore.—p. 1255.
*Eye Disease Due to Vitamin Deficiency in Trinidad: Tropical Nutritional Amblyopia; Essential Corneal Epithelial Dystrophy; Conjunctional Bleeding in Newborn. Vivian M. Métivier, Port-of-Spain, Trinidad, British West Indies.—p. 1265.
Cephalic Tetanus Following Injury to Eyeball. G. G. Jayme-Goyaz, Rio de Janeiro, Brazil.—p. 1281.
Role of Home Training in Orthoptics. Elizabeth K. Stark, New York.—p. 1299.

Eye Disease and Vitamin Deficiency in Trinidad.—Métivier points out that, while frank beriberi and classic pellagra are clinical curiosities in Trinidad, the ocular manifestations of vitamin B deficiency, particularly vitamin B_2, are frequent. As long as attempts are made to designate all vitamin deficiency diseases as pellagra the great morbidity in the colonies due to vitamin deficiencies will not be unearthed and recent advances will have no meaning. The author discusses the closely related syndromes in which ocular changes and visual defects are prominent features of vitamin deficiency in warm climates. "Tropical nutritional amblyopia" is suggested for the disease which results from failure of vitamin B_2 to maintain nutrition of the optic nerve, either directly or through retinal elements. When the nutrition of the cornea suffers from deficiency of vitamin B_2 essential corneal epithelial dystrophy, particularly ariboflavinosis, is the disease that develops in Trinidad. A dry parched skin is seen in patients with ocular disease due to vitamin B_2 deficiency.

American Journal of Physiology, Baltimore

134:683-822 (Nov.) 1941. **Partial Index**

Respiratory and Circulatory Responses to Acute Carbon Monoxide Poisoning. H. Chiodi, D. B. Dill, F. Consolazio and S. M. Horvath, Boston.—p. 683.
*Emptying Time of Stomach of Old People. E. J. Van Liere and D. W. Northup, Morgantown, W. Va.—p. 719.
Optimal Sodium Chloride Concentration for Oral Saline Diuresis. J. M. Coon, R. O. Noojin and C. Pfeiffer.—p. 723.
Diuretic Effect of Potassium, Calcium and Magnesium Given Orally in Salt Solution. C. Pfeiffer, C. Roby and R. B. Smith.—p. 729.
Enzymatic Inactivation of Cholecystokinin by Blood Serum. H. Greengard, I. F. Stein Jr. and A. C. Ivy, Chicago.—p. 733.
Red Cell Counts, Percentage Volume and Opacity of Suspensions. E. Ponder, Mineola, N. Y.—p. 739.
Shock Following Venous Occlusion of Leg. S. Perlow, S. T. Killian, L. N. Katz and R. Asher, Chicago.—p. 755.
Action of Exercise on Ketosis. D. R. Drury, Los Angeles; A. N. Wick and E. M. MacKay, La Jolla, Calif.—p. 761.
Fetal Aspirations of Amniotic Fluid. N. W. Shock, with assistance of L. A. Telesco and W. Heisler, Los Angeles.—p. 769.
Effect of Insulin on Cardiac and Liver Glycogen. G. Evans, Minneapolis.—p. 798.
Inhibition of Pyloric Sphincter Region by Digestion Products of Fat. J. P. Quigley and I. Meschan, Cleveland.—p. 803.
Roentgenographic Observations Suggesting Difference Between Total and Circulating Blood Volume. R. B. Rutherford, E. W. Godfrey and J. Q. Griffith Jr., Philadelphia.—p. 808.

Gastric Emptying Time of Old People.—Van Liere and Northup determined, under the fluoroscope, the gastric emptying time of 12 men from 58 to 84 years of age. Ten of the subjects were indigent persons residing in a county infirmary, 1 was a college professor and 1 was a janitor. The average gastric emptying time of the 12 men was one and ninety-four hundredths hours; the extremes ranged from one and thirty-three hundredths to two and seventy-five hundredths hours. The corresponding figures for 59 young adults were two and eight hundredths, one and three hundredths and three and eight hundredths hours. It seems that senescence does not influence gastric emptying.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

46:447-604 (Oct.) 1941

Classification of Tumors of Thyroid. S. Warren, Boston.—p. 447.
Radiation Treatment of Carcinoma of Thyroid. H. F. Hare, Boston.—p. 451.
Experiences in Treatment of Malignant Tumors of Thyroid Gland. U. V. Portmann, Cleveland.—p. 454.
Radioactive Iodine as Indicator in Thyroid Physiology: Observations on Rabbits and on Goiter Patients. S. Hertz, Boston.—p. 467.
Carcinoma of Thyroid. F. H. Lahey, Boston.—p. 469.
*Roentgenologic Diagnosis of Primary Carcinoma of Liver. R. Schatzki, Boston.—p. 476.
An Unusual Intracranial Foreign Body. R. Drane, Savannah, Ga.—p. 484.
Neuroblastoma Sympatheticum: Roentgenologic Appearances and Radiation Treatment. G. M. Wyatt and S. Farber, Boston.—p. 485.
Multiple Striae Parallel to Epiphyses and Ring Shadows Around Bone Growth Centers. C. A. Stammel, Fort Benning, Ga.—p. 497.
Treatment of Mixed Tumors of Salivary Glands by Roentgen Rays and Radium. J. McFarland, Philadelphia.—p. 506.
Dermatoses Associated with Roentgen Therapy. S. G. Castigliano, Philadelphia.—p. 518.
Roentgen Radiation as Analgesic Agent. J. R. Carty and Lucille M. Bond, New York.—p. 532.
Experimental Modification of Sensitivity of Yeast to Roentgen Rays. R. S. Anderson and H. Turkowitz, New York.—p. 537.
Nonharmful Effects of Irradiation of Pituitary Region of Rabbits. J. Kotz, J. F. Elward and Elizabeth Parker, Washington, D. C.—p. 543.

Roentgenologic Diagnosis of Hepatic Carcinoma.—According to Schatzki, the roentgen demonstration of a mass in the region of the liver and the lobulation of the diaphragmatic shadow may be produced by metastatic tumors, echinococcus cysts and possibly gumma as well as primary hepatic cancer. Any localized bulge of the diaphragm in a patient with proved cirrhosis of the liver should be taken seriously, particularly if it occurs in an unusual location, and the possibility of a primary hepatic cancer in all such patients should be considered. A combination of cirrhosis of the liver (varices) and a mass in the region of the liver is highly suggestive of a primary hepatic cancer. The combination of cirrhosis (varices) and positive evidence of cancer (i. e., pulmonary metastasis) is less conclusive. However, the presence of all three factors makes the diagnosis of primary hepatic cancer extremely likely. The author reports 4 cases in which a roentgen diagnosis of hepatic carcinoma was made.

Annals of Surgery, Philadelphia

114:801-960 (Nov.) 1941

*Prophylaxis of Pulmonary Embolism by Division of Femoral Vein. J. Fine and J. B. Sears, Boston.—p. 801.

Management of Lymph Nodes in Neck—Metastatic from Carcinoma of Mouth. R. H. Kennedy, New York.—p. 813.

Tumors of Carotid Body: Clinical and Pathologic Considerations of Twenty Tumors Affecting Nineteen Patients (One Bilateral). S. W. Harrington, O. T. Clagett and M. B. Dockerty, Rochester, Minn.—p. 820.

Successful Removal of Saddle Embolus of Aorta, Eleven Days After Acute Coronary Occlusion. I. S. Ravdin and F. C. Wood, Philadelphia.—p. 834.

Reflections on Gastroduodenal Surgery. J. R. Judd, Honolulu, T. H.—p. 840.

Lymphogranuloma Venereum: Treatment of Severe Cases of Anorectal Type by Mucosal Stripping Operation: Preliminary Report. R. H. Patterson, New York.—p. 847.

*Endometriosis: Its Significance. J. V. Meigs, Boston.—p. 866.

Intra-Abdominal Hernia: Review of Thirty-Nine Cases in Which Treatment Was Surgical. C. W. Mayo, L. K. Stalker and J. M. Miller, Rochester, Minn.—p. 875.

Testicular Transplantation: Successful Autoplastic Graft Following Accidental Castration. W. M. Kearns, Milwaukee.—p. 886.

Present Status of Intravenous Fluid Treatment of Traumatic and Surgical Shock. H. N. Harkins and R. D. McClure, Detroit.—p. 891.

Clinical Significance of Prothrombin Deficiency and Its Treatment. J. D. Stewart, Boston.—p. 907.

Treatment of Fractures of Humerus by Means of Hanging Plaster Case —"Hanging Cast." A. D. LaFerté and P. D. Nutter, Detroit.—p. 919.

*Early Diagnosis of Pott's Disease. R. I. Harris, Toronto, Canada, and H. S. Coulthard, Weston, Ont., Canada.—p. 931.

"Unexplained" Infections in Clean Operative Wounds: Importance of Air as Medium for Transmission of Pathogenic Bacteria and Bactericidal Radiation as Method of Control: Analysis of Over 5,000 Operations, Covering Period of Ten and One-Half Years. D. Hart and S. E. Upchurch, Durham, N. C.—p. 936.

Prophylaxis of Pulmonary Embolism.—Fine and Sears state that division of the femoral vein is advisable as a routine prophylactic measure against pulmonary embolism when thrombosis of the deep veins of the lower leg is present or suspected. They do not refer to pulmonary embolism arising from auricular fibrillation or any vascular disorder of the venous system cephalad to the great veins in the pelvis. The value of such prophylaxis can be affirmed only after it has been done in a large series of patients with phlebitis and the incidence of fatal and nonfatal pulmonary embolus has been lowered significantly. The most desirable site for blocking the discharge of an embolus from the deep veins of the lower leg is just below the vena profunda.

Endometriosis.—Meigs believes that the increased frequency of endometriosis, a representation of an abnormal physiology, is due to late marriage and delayed and infrequent childbearing. To prove this contention he compares the incidence of endometriosis among 400 consecutive private patients, most of them fairly well to do, who had abdominal gynecologic operations and 400 patients from the Massachusetts General Hospital. The hospital patients are of the social status that marries early and has children frequently. The more normal functions of this group are reflected in the small incidence of endometriosis. Of the private patients 112, or 28 per cent, showed microscopic evidence of endometriosis, as against 23, or 5.8 per cent, in the Massachusetts General Hospital group. Further study shows that endometriosis is a stigma of infertility, and it is due to uninterrupted menstrual cycles, because of late marriage and infrequent childbearing. It is increasing among women having few children and having them late in life. Early marriage and early and frequent childbearing should be urged.

Pott's Disease.—Harris and Coulthard emphasize three early manifestations of Pott's disease which permit early diagnosis: 1. An analysis of the quality of the pain from which the patient suffers demonstrates that it is of spinal origin, is intensified by movement, weight bearing and jolting and is relieved by rest. 2. Roentgen study reveals a thin intervertebral disk before the characteristic caries of the vertebral bodies is manifest. 3. Aspiration of the focus of infection under roentgen guidance will yield pus from which a positive diagnosis can be made.

Archives of Pathology, Chicago

32:689-888 (Nov.) 1941

*Vitamin A Deficiency and the Nervous System. S. B. Wolbach and O. A. Bessey, Boston.—p. 689.

Neuropathologic Changes in Experimental Carbon Disulfide Poisoning in Cats. A. Ferraro, G. A. Jervis and D. J. Flicker, New York.—p. 723.

Growth Processes in Mammary Glands of Mice of Strains Differing in Incidence of Mammary Carcinoma. L. Loeb and V. Suntzeff, St. Louis.—p. 739.

Relation of "Anitschow Myocyte" to Rheumatic Inflammation. B. J. Clawson, Minneapolis.—p. 760.

Kaposi's Disease. D. Symmers, New York.—p. 764.

*Incidence of Occult Adenocarcinoma of Prostate: After Fifty Years of Age. E. Baron and A. Angrist, Jamaica, N. Y.—p. 787.

Effects of Continued Administration of Sulfathiazole and Sulfapyridine in Monkeys. D. R. Climenko, Rensselaer, N. Y., and A. W. Wright, Albany, N. Y.—p. 794.

Perchlorate Method for Determining Concentration of Alcohol in Expired Air as Medicolegal Test. W. W. Jetter, Boston, and G. C. Forrester, Niagara Falls, N. Y.—p. 828.

Tumors of Spinal Cord. J. W. Kernohan, Rochester, Minn.—p. 843.

Vitamin A Deficiency and the Nervous System.—From their experiments on laboratory animals Wolbach and Bessey predict that acute uncomplicated vitamin A deficiency in infants would produce the same changes: an overgrowth of the central nervous system (in relation to osseous growth) with consequent mechanical injuries to the brain, spinal cord and nerve roots.

Incidence of Occult Adenocarcinoma of Prostate.—Baron and Angrist state that the examination of random sections of the prostate gland in 364 men more than 50 years of age revealed adenocarcinoma in 14.8 per cent; the prostates of 9.9 per cent contained occult adenocarcinoma, and 4.9 per cent of the 364 patients died of extensive prostatic adenocarcinoma with metastasis.

Bulletin New York Academy of Medicine, New York

17:823-884 (Nov.) 1941

Carcinoma of Stomach Emphasizing Some Misconceptions of the Disease. J. W. Hinton, New York.—p. 829.

Acute Surgical Conditions of Abdomen in Children. C. W. Lester, New York.—p. 844.

Treatment of Disorders of Menopause. R. T. Frank, New York.—p. 854.

Medical Testimony in Personal Injury Action. W. J. Kernan, New York.—p. 864.

Evolution of Clinical Sphygmomanometry. W. H. Lewis Jr., New York. —p. 871.

Canadian Medical Association Journal, Montreal

45:385-478 (Nov.) 1941

Human Cord Serum Globulin in Modification and Prevention of Measles. L. P. Strean, G. J. Strean, Montreal; D. Lapointe and E. Dechene, Quebec.—p. 385.

Special Problems of the Royal Canadian Air Force Medical Officer. G. E. Hall, Weston, Ont.—p. 387.

Peptic Ulcer Problem. R. W. I. Urquhart, A. C. Singleton and W. R. Feasby, Toronto.—p. 391.

Comparison of Isinglass and Gelatin as Blood Substitutes. E. T. Waters, Toronto.—p. 395.

Postwar Problems. A. F. Menzies, Morden, Man.—p. 399.

Right Sided Aortic Arch: Report of Two Cases. D. Eisen and H. N. Taube, Toronto.—p. 402.

Total Gastrectomy: Report of Case. S. S. Peikoff, Winnipeg, Man.—p. 407.

Anterior Urethral Diverticulum Complicated by Calculi. G. C. Seymour, Barrie, Ont.—p. 410.

Problems in Diagnosis of Acute Surgical Lesions of Abdomen. O. W. Niemeier, Hamilton, Ont.—p. 412.

*Blood Prothrombin in Newborn: Effect of Vitamin K on Blood Prothrombin and on Hemorrhagic Disease of Newborn. S. G. Ross and H. T. Malloy, Montreal.—p. 417.

Results of Thoracoplasty in Advanced Pulmonary Tuberculosis: Preliminary Report. D. Ackman, Montreal.—p. 422.

*Paroxysmal Tachycardia in Childhood. H. Baker, Fairy Glen, Sask.—p. 426.

Appendicitis: Statistical Study. A. L. Murphy and W. E. Hirtle, Halifax, N. S.—p. 430.

Investigation and Treatment of Injuries About Knee Joint. H. R. Inksater, Calgary, Alta.—p. 433.

Primary Carcinoma of Lung: Pneumonectomy. W. C. Whiteside, Edmonton, Alta.—p. 436.

Pneumatotherapy: Therapeutic Use of Oxygen and Other Gases. H. R. Griffith, Montreal.—p. 439.

Blood Prothrombin in Newborn.—Ross and Malloy found that newborn infants showing asphyxia have spontaneous hemorrhage more frequently than normal infants. In 3 of 9 such infants spontaneous bleeding developed. The maximal prothrombin time of these 9 infants was between 110 and 300 seconds, with an average of 195 seconds. These high values and the

fact that 3 bled spontaneously may be of some significance. Anoxemia may be a factor in the production of hypoprothrombinemia in this condition. There is no relationship between physiologic jaundice of the newborn and hypoprothrombinemia. Therefore the authors suggest that a prophylactic dose of vitamin K might be of value for premature infants (because of their tendency to traumatic and spontaneous hemorrhage) and in newborn infants with asphyxia. Vitamin K is also indicated in traumatic bleeding, especially intracranial hemorrhage.

Paroxysmal Tachycardia in Childhood.—Baker reports the presence of the classic type of paroxysmal tachycardia in a girl of 16. Clinically the girl's heart was normal, in spite of recurrent attacks of paroxysmal tachycardia for eight years (since she was 8). The tachycardia conformed to the classic adult type in every respect.

Canadian Public Health Journal, Toronto

32:491-538 (Oct.) 1941

Morbidity Survey in Municipal Doctor Areas in Manitoba: May 1, 1938 to April 30, 1940. F. W. Jackson, Winnipeg, Man.—p. 491.
Recent Advances in Tuberculosis Control in Ontario. G. C. Brink, Toronto.—p. 502.
New Immunization Program in Royal Canadian Air Force. A. H. Sellers, Toronto.—p. 509.
Report of Outbreak of Trichinosis. W. J. Deadman and D. C. Wilson, Hamilton, Ont.—p. 513.
Fatigue Syndrome in School Children. H. E. Edwards and W. J. Tamblyn, Toronto.—p. 518.

Georgia Medical Association Journal, Atlanta

30:415-456 (Oct.) 1941

Further Observations on Treatment of Cancer of Breast: Review of 139 Reports of Cases. T. Harrold, Macon.—p. 415.
Trends in Medical Education in Georgia: Undergraduate Medical Education. G. L. Kelly, Augusta.—p. 423.
Graduate Medical Education. R. H. Oppenheimer, Atlanta.—p. 429.
Medical Preparedness. J. E. Baylis, Atlanta.—p. 434.
So That Is Allergy. M. A. Ehrlich, Bainbridge.—p. 438.
Surgery as Aid to Diagnosis. F. W. McRae, Atlanta.—p. 441.
Large Ovarian Cyst: Dermoid Variety. S. E. Sanchez, Barwick.—p. 444.

Journal of Clin. Endocrinology, Springfield, Ill.

1:859-930 (Nov.) 1941

*Hyperthyroidism in the Adolescent: Analysis of Eighteen Cases Under Eighteen Years of Age. J. B. Black Jr. and B. Webster, New York.—p. 859.
Pancreatic Encephalopathy. N. O. Rothermich and E. von Haam, Columbus, Ohio.—p. 872.
Creatine-Creatinine Metabolism in Older Patients with Benign Prostatic Enlargement. M. B. Sutton, New York.—p. 882.
Biologic Assay of Blood Estrogens by Intravaginal Application of Extracts and Desiccated Material. A. S. Albrieux, San Francisco.—p. 889.
Distribution of Estrogens in Blood of Pregnant and Nonpregnant Women. A. S. Albrieux, San Francisco.—p. 893.
Control of Menopausal Symptoms with Estradiol Benzoate: Impressions Gained in Treating a Group of Forty Patients. E. G. Waters, Jersey City, N. J.—p. 895.
*Management of Primary Amenorrhea in Hypopituitarism. E. A. Ornstein, New York.—p. 899.
Laurence-Moon-Biedl Syndrome: Case Report with Complete Autopsy. N. L. Anderson, Durham, N. C.—p. 905.
Cushing's Syndrome: Two Cases Treated with Stilbestrol. A. E. Rakoff, A. Cantarow and K. E. Paschkis, Philadelphia.—p. 912.
Pitressin Inhibiting Substance in Serum of Patient with Transient Diabetes Insipidus. R. B. Rutherford and J. Q. Griffith Jr., Philadelphia.—p. 916.
Extraction and Assay of Lactogenic Hormone in Postpartum Urine. J. Meites and C. W. Turner, Columbia, Mo.—p. 918.
Growth and Sex Hormones. M. A. Goldzieher, New York.—p. 924.

Adolescent Hyperthyroidism.—Black and Webster state that, from September 1932 to September 1940, 747 patients with diffuse or nodular toxic goiters were seen at the New York Hospital and that 26 of them were less than 18. Eighteen of the 26 adolescents were patients of the medical and surgical services; 17 had toxic diffuse goiter and 1 had a toxic nodular goiter. In the group there were 15 girls and 3 boys aged 10 to 17 years at the time the symptoms ensued. In 13, all girls, the onset of symptoms occurred at the 13 and the 14 year age level. The etiologic factors involved include infection (either closely preceding or associated with the appearance of symptoms), psychic trauma, exophthalmic goiter or "goiter trouble" in parents or close relatives and a combination of the foregoing factors. Only 1 of the patients, a boy, had another associated endocrine disorder; he showed signs of hypogonadism. All but one of the glands that were resected were described by the pathologist as "hyperplastic goiters" with various degrees of involution. The exception was described as an "intermediate adenomatous goiter (fetal adenoma)." The symptoms of this patient were entirely similar to those of the other patients although exophthalmos was not present. Conservative, nonsurgical treatment failed to arrest the disease of 5 of 6 patients. After thyroidectomy the growth and the mental development of the children operated on proceeded, in the absence of any recurrence, in an entirely normal manner. Postoperative myxedema of any permanent importance did not occur. However, postoperative recurrences and persistent hyperthyroidism occurred in 3 of the patients who had thyroidectomy. This complication apparently developed irrespective of the mode or the duration of the preoperative or the postoperative management. Therefore thyroidectomy is a therapeutic necessity, and the physician, while fully aware of the risk entailed, has no reasonable alternative but to advise such a procedure.

Amenorrhea and Hypopituitarism.—Ornstein employed estrogens for the treatment of 4 patients (aged 27, 24, 19 and 16 respectively) with hypopituitarism of the Lorain-Levi type, with sexual and somatic infantilism. Continuous treatment induced cyclic uterine bleeding associated with changes in the secondary sex characteristics. Parenteral and oral therapy were equally effective. The implantation of pellets of estradiol benzoate complemented by regularly spaced periods of oral administration of progesterone was most effective. When therapy was discontinued or the gonadotropes were used, bleeding ceased and the increased mammary tissue regressed about 25 per cent. Pregnant mare's serum and a combination of chorionic gonadotropin and an anterior pituitary gonadotropic extract were ineffective in inducing bleeding or in maintaining the secondary sex characteristics. The psychologic improvement alone justifies the treatment. Therapy should not be begun before 17, or at least until delayed puberty has been ruled out.

Journal of Clinical Investigation, New York

20:467-606 (Sept.) 1941

Influences of Erythrocytes and of Leukocytes on Stability and Transfer of Ascorbic Acid in Human Blood. M. Heinemann, New Haven, Conn.—p. 467.
Evidence for General Distribution of Peripheral Resistance in Coarctation of Aorta: Report of Three Cases. J. M. Steele, New York.—p. 473.
Treatment of Cirrhosis of Liver by Nutritious Diet and Supplements Rich in Vitamin B Complex. A. J. Patek Jr. and J. Post, New York.—p. 481.
Intravenous Glucose Tolerance Test. E. L. Lozner, Boston; A. W. Winkler, New Haven, Conn.; F. H. L. Taylor, and J. P. Peters, New Haven, Conn.—p. 507.
Peripheral Vascular Response to Exercise in Hyperthyroid State. D. L Abramson and S. M. Fierst, Cincinnati.—p. 517.
Studies on Pain: Observations on Pain Due to Local Cooling and on Factors Involved in "Cold Pressor" Effect. S. Wolf and J. D. Hardy, New York.—p. 521.
Formulas for Afferent and Efferent Arteriolar Resistance in Human Kidney: Application to Effects of Spinal Anesthesia. H. Lamport, New York.—p. 535.
Relative Changes in Afferent and Efferent Arteriolar Resistance in Normal Human Kidney. H. Lamport, New York.—p. 545.
Mechanisms of Respiratory Failure Under Barbiturate Anesthesia (Evipal, Pentothal). H. K. Beecher and C. A. Moyer, Boston.—p. 549.
Clinical Studies with Aid of Radioactive Phosphorus: I. Absorption and Distribution of Radiophosphorus in Blood and Its Excretion by Normal Individuals and Patients with Leukemia. L. A. Erf and J. H. Lawrence, San Francisco.—p. 567.
Studies on Neoplasms with Aid of Radioactive Phosphorus: III. Phosphorus Metabolism of Phospholipid, Acid Soluble and Nucleoprotein Fractions of Various Tissues of Normal and Leukemic Mice Following Administration of "Tracer" and "Therapeutic" Doses of Radiophosphorus. L. W. Tuttle, L. A. Erf and J. H. Lawrence, San Francisco.—p. 577.
Experimental and Clinical Studies on Gramicidin. W. E. Herrell and Dorothy Heilman, Rochester, Minn.—p. 583.
Acute Hemolytic Anemia from Sulfonamides. C. L. Fox Jr. and R. Ottenberg, New York.—p. 593.
Spectrophotometry of Fairley's New Blood Pigment, Methemalbumin. C. L. Fox Jr., New York.—p. 603.

Journal of Experimental Medicine, New York

74:397-510 (Nov.) 1941

Transplantable Epitheliomas of Lip and Mouth of Catfish: I. Pathology: Transplantation to Anterior Chamber of Eye and into Cornea. B. Lucké and H. Schlumberger, Philadelphia.—p. 397.

*Complement Fixation Test in Diagnosis of Virus Infections of Central Nervous System. J. Casals and R. Palacios, New York.—p. 409.

Cultivation of Hog Cholera Virus. C. TenBroeck, Princeton, N. J.—p. 427.

*Neutralizing Antibodies in Human Serum After Influenza A: Lack of Strain Specificity in Immunologic Response. F. L. Horsfall Jr. and E. R. Rickard, New York.—p. 433.

Studies on Conditions Affecting Survival in Vitro of Malarial Parasite (Plasmodium Lophurae). W. Trager, Princeton, N. J.—p. 441.

Influence of Extraneous Protein and Virus Concentration on Inactivation of Rabbit Papilloma Virus by X-Rays. W. F. Friedewald and R. S. Anderson, New York.—p. 463.

Comparative Virulence of St. Louis Encephalitis Virus Cultured with Brain Tissue from Innately Susceptible and Innately Resistant Mice. L. T. Webster and Mary S. Johnson, New York.—p. 489.

Serologic Specificity of Particulate Components Derived from Various Normal Mammalian Organs. W. Henle, L. A. Chambers and V. Groupé, Philadelphia.—p. 495.

Virus Infections of Central Nervous System.—Casals and Palacios describe a complement fixation test for various virus infections of the central nervous system for which emulsions of infected brain tissue are used. The brain emulsion is frozen, thawed and then centrifuged in an angle head centrifuge at 3,500 revolutions per minute for one hour. The method has proved reliable in experiments with rabies, St. Louis encephalitis, Japanese B encephalitis, lymphocytic choriomeningitis, eastern and western equine encephalomyelitis, louping ill and spontaneous encephalomyelitis of mice (Theiler's disease). Complement fixing antibodies in high titer were found in the serums of rabbits, guinea pigs, mice and dogs immunized with rabies virus. Complement fixing antibodies were present in high titer in the serum from 2 persons eight years after an attack of louping ill, from 5 persons two and one-half years after an attack of eastern equine encephalomyelitis and from 2 persons two and one-half years after they had western equine encephalomyelitis. Complement fixing antibodies of St. Louis encephalitis and lymphocytic choriomeningitis have been found soon after infection but not after long periods.

Neutralizing Antibodies After Influenza A.—Horsfall and Rickard determined the neutralizing capacity of the serum from 5 patients with influenza A against three antigenically different strains of influenza A virus and one strain of swine influenza virus. With a single exception all the serum produced almost identical quantities of neutralizing antibodies against each of the virus strains used. Although the serum of the fifth patient had similar concentrations of antibodies against strain 399, the PR8 strain of influenza A virus and the swine influenza virus, only a slight increase in antibodies was demonstrable against the W. S. strain. The increases in neutralizing antibody levels of the serum of the 5 patients after infection were as readily demonstrable when one antigenically different strain of influenza A virus was used as when another one was used. Furthermore, even when the swine influenza virus was used closely similar alterations in antibody levels were encountered. The data of the study indicate that in adults, irrespective of the time which elapses after the onset of influenza A, there is an almost complete lack of strain specificity in the immunologic response that follows.

Journal of Immunology, Baltimore

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Factor in Normal Human Blood Which Participates in Streptococcic Fibrinolysis. H. Milstone, New York.—p. 109.

Development of Neutralizing Antibodies to Viruses of Equine Encephalomyelitis (Western Strain) and St. Louis Encephalitis in Blood and Cerebrospinal Fluid of Man and Animals, Together with Recovery of St. Louis Virus from Blood of Monkeys. Beatrice F. Howitt, San Francisco.—p. 117.

Studies with Hemophilus Pertussis: VI. Antigenicity of Toxins and Relation to Other Cellular Components from Several Phases. E. W. Flosdorf, A. Bondi and T. F. Dozois, Philadelphia.—p. 133.

Effect of Dilution on Reaction Between Pneumococcus and Its Specific Antibody: II. Dilution Phenomenon. M. C. Morris, St. Louis.—p. 219.

Further Studies in Passive Protection Against Virus of Influenza by Intranasal Route. J. Zellat and W. Henle, Philadelphia.—p. 239.

Journal of Infectious Diseases, Chicago

69:97-192 (Sept.-Oct.) 1941

Chemotherapeutic Testing with Sodium Sulfathiazole in Developing Chick Embryo. A. J. Weil and L. S. Gall, Pearl River, N. Y.—p. 97.

Studies on Purification of Alum Precipitated Diphtheria Toxoid. S. C. Seal and Sylvia J. Johnson, Jamaica Plain, Mass.—p. 102.

Determination of Activity of Various Drugs Against Malaria Parasite. L. T. Coggeshall and J. Maier, New York.—p. 108.

Accessory Growth Factor Requirements of Some Representatives of Brucella Group. S. A. Koser, Beverly B. Breslove and A. Dorfman, Chicago.—p. 114.

Treatment of Group C. Streptococcus Infection in Guinea Pigs with Vitamin C and Sulfanilamide. L. Karel, T. C. Grubb and C. W. Chapman, Baltimore.—p. 125.

Canine Leptospirosis in Pennsylvania. Clara Raven, Philadelphia.—p. 131.

Comparison of Seven Strains of Virus of Lymphogranuloma Venereum. Enid C. Rodaniche, Chicago.—p. 138.

Oxidation-Reduction Potentials in Salmonella Cultures: III. Relation Between Characteristic Potential and Antigenic Structure. W. Burrows, Chicago.—p. 141.

Actinomyces of Human Mouth. B. G. Bibby and H. T. Knighton, Rochester, N. Y.—p. 148.

Relation of Volatile Fatty Acids and Hydrogen Sulfide to Intestinal Flora. O. Bergeim, A. H. Hanszen, L. Pincussen and E. Weiss, Chicago.—p. 155.

Salmonella Types in Silver Foxes. R. G. Benedict, Elizabeth McCoy and W. Wisnicky, Madison, Wis.—p. 167.

Quantitative Studies on Neutralization of Purified Papilloma Virus: II. Reversibility of Serum Effect by Simple Dilution. Dorothy Beard, A. R. Taylor, D. G. Sharp and J. W. Beard, Durham, N. C.—p. 173.

Journal-Lancet, Minneapolis

61:393-434 (Oct.) 1941

The Sex Steroid Family. E. C. Hamblen, Durham, N. C.—p. 393.

Method of Evaluating Effect of Treatment in Neuromuscular Disorders. R. S. Schwab, Boston, and J. E. Skogland, Minneapolis.—p. 401.

Vulnerable Structures of Bacterial Cell. R. J. Dubos, New York.—p. 405.

Chronic Gastritis: Clinical and Gastroscopic Study. J. B. Carey, Minneapolis.—p. 408.

Hospitalization of University Students. E. L. Shrader, St. Louis.—p. 411.

Therapeutic Procedures in Chronic Rheumatoid Disease. M. Wetherby, Minneapolis.—p. 414.

Spontaneous Pneumothorax of Unknown Etiology. Elizabeth A. Leggett, Kent, Ohio.—p. 417.

Poison Antidotal Kit. Annette C. Washburne, Madison, Wis.—p. 420.

Rowing Method of Artificial Respiration. M. C. Rosekrans, Neillsville, Wis.—p. 421.

What the Public Knows About Health. M. Derryberry, Washington, D. C.—p. 423.

Journal of Nutrition, Philadelphia

22:439-540 (Nov.) 1941. **Partial Index**

Alpha-Tocopherol Requirement of Rat for Reproduction in Female and Prevention of Muscular Dystrophy in Young. Marianne Goettsch and A. M. Pappenheimer, New York.—p. 463.

Utilization of Calcium of Cauliflower and Broccoli. Margaret L. Fincke, Corvallis, Ore.—p. 477.

Dietary Requirements for Fertility and Lactation: XXIX. Existence of New Dietary Factor Essential for Lactation. B. Sure, Fayetteville, Ark.—p. 499.

*Influence of Prenatal Diet on Mother and Child. J. H. Ebbs, P. P. Tisdall and W. A. Scott, Toronto, Canada.—p. 515.

Thiamine, Nicotinic Acid, Riboflavin and Pantothenic Acid in Rye and Its Milled Products. A. J. Ihde and H. A. Schuette, Madison, Wis.—p. 527.

Nicotinic Acid Content of Meat and Meat Products. J. M. McIntire, H. A. Waisman, L. M. Henderson and C. A. Elvehjem, Madison, Wis.—p. 535.

Influence of Antepartum Diet.—Ebbs and his associates studied the antepartum diets of 380 women with low incomes. A group of 120 women found to be on a poor diet was left as a control, the diet of a group of 90 women on a poor diet was supplemented with milk, eggs, oranges, tomatoes and cheese during the last three or four months of pregnancy and the diet of 170 women on a moderately good antepartum diet was improved by education alone. The mothers on a good or a supplemented diet enjoyed better health, had fewer complications during pregnancy and proved better obstetric risks than those on a poor diet. Miscarriage, stillbirth and premature birth as the result of the pregnancy of the women on poor diets were more frequent, and the incidence of death and of illness among their babies up to the age of 6 months was many times greater.

Minnesota Medicine, St. Paul

24:901-1020 (Nov.) 1941

Role of Tonsils and Adenoids in Respiratory Infections in Children. A. D. Kaiser, Rochester, N. Y.—p. 919.
*Apparent Spread of Poliomyelitis Through Four Families. J. E. Perkins, Albany, N. Y.—p. 924.
Craniocerebral Injuries. W. P. Ritchie, St. Paul.—p. 935.
Treatment of Common Eye Injuries. A. D. McCannel, Minot, N. D.—p. 939.
Injuries to Soft Tissues of Neck. T. J. Kinsella, Minneapolis.—p. 942.
Penetrating Wounds of Abdomen. G. I. Badeaux, Brainerd.—p. 944.
Physical Examinations in Industry. E. V. Goltz, St. Paul.—p. 948.

Poliomyelitis.—In order to add to the available data on the transmission of poliomyelitis Perkins reports its apparent radial spread in 1930 by four rural households in the southwestern corner of Minnesota. There were a total of 166 patients, with involvement ranging from fatal paralysis to involvement which merely produced pain on anterior flexion of the neck. Concerning 53 of the 166 patients investigated a history of exposure within thirty days of illness to another patient, acutely paralyzed or nonparalyzed, was obtained. Among the 878 household members of the 166 patients with paralytic and nonparalytic poliomyelitis 174 had illnesses classified as suggestive (producing systemic symptoms similar to those of patients with a diagnosis of poliomyelitis but with no evidence of involvement of the nervous system). Some additional illnesses may have occurred subsequent to the author's last visit. No one suggestive symptom exceeded 50 per cent, but a total of 82 per cent of the patients had headache, fever, diarrhea and/or vomiting. Headache was always combined with one or more of the suggestive symptoms. There was a similarity in the age distribution among the patients with definite and suggestive illnesses. The rate of attack of definite disease was higher for males than for females in all but the group aged 25 to 49. For the suggestive disease the reverse was true. If it is assumed that the illness of the patients with suggestive disease also was due to the poliomyelitis virus it may be hazarded that, although male patients experience involvement of the nervous system more frequently, female patients suffer a higher subclinical attack rate.

New York State Journal of Medicine, New York

41:2083-2178 (Nov. 1) 1941

Recent Developments in Field of Laboratory Medicine. R. G. Stillman, New York.—p. 2107.
Principles of Treatment of Epilepsy, with Particular Reference to Surgical Aspect. W. P. Van Wagenen, Rochester.—p. 2112.
Oxycephaly. J. E. J. King, New York.—p. 2119.
Chemotherapy of Pyogenic Meningitis with Sulfonamides. W. B. Weary and J. J. A. Lyons, Albany.—p. 2124.
Health Program for Youth Organizations. J. G. F. Hiss, Syracuse.—p. 2132.
Demonstration of a County 4-H Club Health Program. Evelyn F. H. Rogers, Oneonta.—p. 2134.
The Physician's Role in a County 4-H Health Project. T. C. Monaco, Walton.—p. 2139.
Medical Practice for Body and Mind. H. I. Gosline, Ossining.—p. 2141.

Public Health Reports, Washington, D. C.

56:2105-2144 (Oct. 31) 1941

Epidemiologic Study of Calcified Pulmonary Lesions in Ohio County. B. J. Olson, W. H. Wright and M. O. Nolan.—p. 2105.
Description of Home Made Hydraulic Dredge Employed in Malaria Control at Perry, Fla. A. C. Newman.—p. 2127.

Epidemiologic Study of Calcified Pulmonary Lesions.—From the roentgenograms of 279 members of forty-four households Olson and his associates found that a high familial incidence (of 49.4 per cent among the 253 household members of whom adequate roentgenograms were had) of pulmonary calcification existed among these families, who resided in Ross County, Ohio. The selection of households was made through an index person, a pupil, found to have pulmonary calcification in the survey made by Lumsden and Dearing in three Ross County schools. Roentgenologically the calcification produces pulmonary lesions which simulate those of primary tuberculosis. Only 12, or 4.7 per cent, of the 253 household associates had a household history of contact with tuberculosis. No relationship could be demonstrated between the contact and the pulmonary calcification. The possible etiologic part that Ascaris played in the calcification was neither proved nor disproved, as the incidence of parasites in the household members and in samples of soil near their homes was so similar for the persons with and for those without pulmonary calcification that no conclusion could be drawn.

56:2145-2188 (Nov. 7) 1941

*Positive Agglutination Tests in Suspected Cases of Weil's Disease. A. Packchanian.—p. 2145.

Agglutination Tests and Weil's Disease.—During the last four years, using the microscopic agglutination test, Packchanian found agglutinins for type I Leptospira icterohemorrhagiae in the serum of 40 patients suspected of having Weil's disease. One patient resided in Connecticut, 4 in Louisiana, 9 in Maryland, 2 in Massachusetts, 2 in Michigan, 2 in Missouri, 1 in Nevada, 2 in New Jersey, 5 in New York, 4 in Ohio, 1 in Pennsylvania, 4 in Virginia, 2 in West Virginia and 1 in the District of Columbia. Thirty-six patients were men, 1 was a woman and 3 were children. The occupation or the place of residence of most of the patients was such that contact with wild rats might be expected. Six patients died. Sixty-one samples of blood from 36 patients were retested after storage in the refrigerator at 5 C. for one hundred and sixty-nine to one thousand and seventy-eight days and, with four exceptions, strong agglutination reactions with type I L. icterohemorrhagiae were obtained. The agglutination titers approached, or were identical with, the original titers. Blood samples from 20 jaundiced dogs (from Louisiana, Nebraska, New York, Pennsylvania and Virginia) likewise gave strong agglutination reactions in dilutions of 1:30,000 and higher. Virulent strains of L. icterohemorrhagiae were isolated from wild rats (Rattus norvegicus) captured in Detroit, in New York and in Washington, D. C.

Southwestern Medicine, El Paso, Texas

25:311-344 (Oct.) 1941

Nutritional Enteritis. A. C. Reed, San Francisco.—p. 311.
Biophysiologic Considerations in Treatment of Subcapital Fractures of Hip. F. H. Albee, New York.—p. 317.
Effect of Electromagnetic Radiation on Flocculation Tests for Syphilis. E. L. Breazeale, Tucson, Ariz.—p. 321.
Responsibility of the Medical Profession in the National Emergency. J. Dibble, Fort Sam Houston, Texas.—p. 326.

Virginia Medical Monthly, Richmond

68:621-680 (Nov.) 1941

Organized Medicine and Public Welfare. W. B. Martin, Norfolk.—p. 622.
Public Health Problems in Defense Area and Suggestions for Correction. A. G. Evans, Christiansburg.—p. 626.
Surgical Correction of Neurofibromatosis (Plexiform Neuromas) About the Orbit. E. B. Spaeth, Philadelphia.—p. 630.
Pylephlebitis. H. J. Warthen, Richmond.—p. 643.
Outbreak of Botulism in Orange County. F. G. Scott Jr. and R. B. Mallett, Orange.—p. 646.
The Common Cold. H. L. Harris, Richlands.—p. 649.
Histologic Studies of Hypothalamus. H. Brick and E. H. Ingersoll, Richmond.—p. 652.
Convulsions Associated with General Anesthesia: Report of Three Cases. S. Newman, Danville.—p. 655.
Experiences with Paravertebral Block of Lumbar Sympathetic Trunk. B. W. Rawles Jr., Richmond.—p. 657.
Blood Pressure in Relation to Age, Weight and Height: Analysis of 15,225 Blood Pressure Determinations. A. G. Schnurman, Radford.—p. 660.

West Virginia Medical Journal, Charleston

37:481-528 (Nov.) 1941

Sudden Death. J. L. Wade, Parkersburg.—p. 481.
Conservative Use of Posterior Pituitary Solution in Labor. H. E. Baum, Charleston.—p. 487.
Evaluation of Human Immune Globulin in Measles. J. Basman, Charleston.—p. 491.
Opportunities Presented to the Physician in the Field of Industrial Hygiene. P. A. Neal, Washington, D. C.—p. 495.
Finger Injuries. C. B. Buffington, Wheeling.—p. 499.
Dust and Gases Found in Coal Mines. R. R. Sayers, Bethesda, Md.—p. 503.
Medicine in Music. W. R. Wiant, Charleston.—p. 508.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

53:269-298 (Oct.) 1941

Endocrine Factors in Acne Vulgaris. E. L. Cohen.—p. 269.
Possible Case of Kaposi's Sarcoma. A. A. M. Nicol and H. A. Cookson. —p. 283.

British Journal of Ophthalmology, London

25:461-508 (Oct.) 1941

Hereditary Optic Atrophy with Dominant Transmission and Early Onset. J. G. Scott.—p. 461.
Histologic Interpretation of Appearances in Fundus Oculi: Scheme for Methodical Investigation. A. J. Ballantyne.—p. 480.
Boeck's Sarcoidosis: Case. E. V. Srinivasan.—p. 493.

Journal of Laryngology and Otology, London

56:277-312 (Aug.) 1941

*Relationship Between Diseases of Upper Respiratory Passages and Surgery of Chest. F. C. Ormerod.—p. 277.
Transantral Approach to Ethmoidal and Sphenoidal Sinuses: Some Further Considerations. J. B. Horgan.—p. 290.

Respiratory Disease and Chest Surgery.—Ormerod assessed the part that disease of the upper respiratory tract had in the condition of 40 patients with bronchiectasis. Eighteen of the patients had no demonstrable lesion in the upper air passages though 3 had had tonsillectomies many years before. The other 22 showed some inflammatory lesion in the nose, the paranasal sinuses, the postnasal space or the pharynx. Fourteen of these 22 had had operations on the nose or the throat. Data show that about 80 per cent of patients with bronchiectasis have some degree of infection of the paranasal sinuses but that disease of the tonsils is of slight etiologic importance. About 20 per cent or more of the patients with pulmonary abscesses had tonsillectomies, and a few had other operations on the upper part of the respiratory tract but sinusitis did not appear responsible for the pulmonary abscesses. The connection between the upper and the lower respiratory tract may be by aspiration, lymph stream, blood stream and direct continuity. The aspiration theory seems to be the most probable. Bronchosinusitis and its sequelae may explain many cases of bronchiectasis though probably not pulmonary abscesses. The foci of disease of the upper respiratory tract should be eliminated before the secondary chronic inflammatory lesions of the lungs are dealt with if a lasting cure is to be obtained and constant reinfection avoided. Sinuses should be drained, polyps removed and severe septal deflections corrected before operation on the chest. In children, with profuse purulent secretion, tonsils and adenoids can be removed with ease and safety after the chest has been treated. However, the nose and throat should be cleared of infected lymphoid tissue before the child leaves the hospital.

Medical Journal of Australia, Sydney

2:405-436 (Oct. 11) 1941

Observations on Effect of Treating Spores of Bacillus Subtilis in Perchlorethylene Under Various Conditions; and on New Method of Sterilizing Surgical Catgut. T. H. Small.—p. 407.
Management of Posterior Position of Occiput in Relation to Shape of Pelvis. T. D. Hughes.—p. 414.
Note on Use of De Laval Separator in Preparation of Human Serum. H. B. Rudduck, Marjorie Bick and Margaret Henderson.—p. 416.
Patency of Ductus Arteriosus in Adults. H. F. Bettinger.—p. 418.

2:437-464 (Oct. 18) 1941

Industrial Fatigue. H. M. L. Murray.—p. 437.
Control of Heat Loss, with Special Reference to Blankets, Clothing, Exposure and Resuscitation. C. E. Corlette.—p. 441.
Blood Pressure Changes Following Localized Myocardial Death. T. E. Lowe.—p. 447.
Interaction Between Anti A Agglutinins in Group B Serum and Receptor Substances in Group A Serum. Lucy M. Bryce and Rachel Jakobowicz.—p. 451.
Investigation of Fungous Infection of Foot in Military Camp. L. W. Linn and F. R. Magarey.—p. 452.

Tubercle, London

22:183-206 (Aug.) 1941

Effusion in Artificial Pneumothorax. F. A. H. Simmonds.—p. 183.

Gastroenterologia, Basel

66:57-120 (No. 2) 1941

Effect of Histamine on Galactose Elimination in Human Subjects After Galactose Tolerance Test. J. Rein.—p. 57.
*Chronic Pancreatitis, with Hyperfunction of Islands of Langerhans. J. W. Grott.—p. 72.
Clinical Aspects of Diverticulum of Duodenojejunal Flexure. W. Schoen.—p. 90.

Chronic Pancreatitis, with Islet Hyperfunction.—Grott reviews observations on 42 cases of chronic pancreatitis in which hyperinsulinism was indicated by low or flat blood sugar curves after tolerance tests with 50 Gm. of dextrose. The starting point of the diagnosis was the physical exploration of the pancreas by the author's method. The patients often complained of general lassitude, sleepiness, increased nervousness and, in rare cases, symptoms of severe hypoglycemia. The physical examination disclosed hypersensitivity in 46 per cent, trophic changes of the skin in 69.5 per cent, pain sensitivity of the pancreas in 97.6 per cent and enlargement of the pancreas in 28.57 per cent. The diastase of the urine was increased in 40 per cent and renal diabetes existed in 45.2 per cent. The author concludes that chronic pancreatitis with hyperfunction of the islands of Langerhans is not a rarity and demands special treatment. Sugar and sweets must be avoided, because they are too rapidly absorbed and stimulate the islands to hyperfunction. If the patients are undernourished, the diet must provide liberal amounts of easily digested fats and proteins. In obese persons, however, the intake of carbohydrates and fats must be restricted. Meals should be frequent but not large.

Zeitschrift für Orthopädie, Stuttgart

71:1-128 (May 31) 1940. **Partial Index**

Results of Treatment of Congenital Dislocation of Hip Joint. F. Schede.—p. 3.
Bone Pegging in Malacias of Upper End of Femur. C. Springer. —p. 67.
Obstetric Traumatic Detachment of Epiphysis of Upper End of Femur Shaft, a Typical Entity and Its Differentiation from Congenital Dislocation of Hip Joint. E. Ruschenburg.—p. 81.
*Sex Ratio in Congenital Clubfoot. C. Mau.—p. 94.

Sex Ratio in Congenital Clubfoot.—Mau presents a collection of domestic and foreign statistics on clubfoot which includes 27,843 cases and shows that 66.59 per cent of the patients are male and 33.41 per cent are female. This 2:1 sex ratio of congenital clubfoot remains constant (in space as well as time). Research on twins shows that the probability of manifestation is comparatively slight but that it affects twice as many males as it does females. It is to be assumed that the abnormal sex ratio is not produced by the anlage that is at the basis of the defect but is connected with peculiarities of gene manifestation. The immutability of the sex ratio of congenital clubfoot suggests sex-linked modifiers which influence the manifestation of clubfoot constantly in the ratio of 2:1 without being themselves subject to manifestation fluctuations.

Bulletin of the Naval Medical Association, Tokyo

30:397-482 (July) 1941. **Partial Index**

*Observations on the Management of War Injuries to the Genitourinary Organs. Y. Nakauchi.—p. 397.

War Injuries of Genitourinary Organs.—Nakauchi analyzed 51 cases of war injuries of the genitourinary organs sustained by the navy crew during the early part of the Chinese war. Of the total patients treated, injuries of the lower urinary tract and the external genitalia were found in 24 (47.1 per cent); of the upper urinary tract, including the kidneys, in 18 (35.3 per cent), and of the urinary bladder in 9 (17.8 per cent). No patient with injuries to the ureters was encountered. The mortality depends on the extent of complications, particularly those of the gastrointestinal tract; in the presence of complications the primary treatment should be directed to them. Unless the renal injury is associated with extensive destruction with hemorrhage, treatment should be conservative. Involvement of the ureter is relatively infrequent but difficult to diagnose; treatment of this condition consists in the establishment of an adequate urinary flow. Injury to the bladder is by far the most important condition which demands a rational management, and the necessity of free urinary excretion and defecation cannot be overemphasized as an essential phase of effective

treatment. The most common type of damage encountered was injury to the lower part of the urethra and the external genitalia; the important point in the treatment of such injury is to avoid the possibility of deformity following complete cure of the initial injury.

Okayama-Igakkai-Zasshi, Okayama

53:1179-1330 (June) 1941. **Partial Index**

*Influence of High Pressure on Erythrocyte Count and Hemoglobin. K. Okuda and N. Sato.—p. 1299.
*Observations on Machine-Oil Acne. S. Suga.—p. 1305.

Erythrocytes Under High Pressure.—Okuda and Sato studied the effect of high pressure on the erythrocyte count and hemoglobin content of 5 healthy men and 4 women divers. The pressure within the tank in which the observations were made was gradually raised to 2 atmospheres, the process of raising or lowering the pressure requiring about thirty minutes. The subjects remained in this tank under high pressure for thirty to sixty minutes; blood examinations, for control determinations, were made just before they entered the tank and again just before the pressure was lowered. In both groups of blood determinations the red cell count showed an average decrease (7.6 per cent in the men and 9.8 per cent in the women), and the hemoglobin values also decreased (3.4 per cent in the men and 5.2 per cent in the women). Thus it is apparent that no significant difference exists in the reduction of either the erythrocyte count or the hemoglobin content under the conditions of these experiments.

Machine Oil Acne.—Suga reports his observations on 12 patients with occupational acne, all of whom were industrial workers who were in constant contact with machine oil. With the exception of 3 women 28, 24 and 19 years of age the condition occurred in young men under 20. The interval of time in which the disease appeared varied from two months to two years, but in the majority of the patients the condition began to manifest itself within four months. Histologically the most conspicuous pathologic change was the keratinization of the epidermis, associated with plugging and swelling of hair follicles due to the development of hornified substances and extensive cellular infiltration around the follicles. Two varieties of occupational acne must be distinguished: (1) the most common form, characterized by the formation of hornified plugs, the amputation of lanugo hairs, lesions inseparable from acne vulgaris, keratinizing acne and pigmentation and crater-like depressions of the skin and seen on the most exposed parts of the body, and (2) the allergic form, typified by lesions on the sites usual in acne vulgaris (the face, back and chest), where the acne lesions are complicated by pustules, large comedos, atheroma and granular scars. This latter form represents the sensitization of the skin to machine oil.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

81:1230-1276 (June 10) 1941. **Partial Index**

*Tropical Hay Fever. F. H. Ter Heege.—p. 1231.

Tropical Hay Fever.—Ter Heege discusses the various types of pollen and shows that wind-borne pollens are chiefly responsible for hay fever. This report deals chiefly with tropical hay fever in the Netherland East Indies, particularly Java. The symptoms of tropical hay fever are much like those of hay fever in the temperate zone. The author describes 8 cases of tropical hay fever in which cutaneous tests were made with pollen or pollen extracts of Zea mays (corn), Sorghum andropogon, coffee and tobacco. Two patients showed a seasonal rhinitis recurring every year, especially during the dry period. For these patients only tests with pollen were made. In the other patients, the hay fever showed an irregular course, and for this reason they were given cutaneous tests not only with pollen but with inhalation and food allergens. These patients showed a multiple allergy. Hay fever in the tropics is often nonseasonal not only because of the irregularity of the pollination periods but on account of multiple allergy. The skin tests for allergens other than pollen are more important in tropical than in nontropical hay fever. With regard to the injection treatment of tropical hay fever, the author says that seasonal as well as nonseasonal treatment can be used, depending on the individual case history.

Nordisk Medicin, Stockholm

11:2737-2796 (Sept. 27) 1941. **Partial Index**

Motility and Secretion of Stomach After Operation for Ulcer. J. P. Strömbeck.—p. 2737.

Hospitalstidende

*Hereditary Hemorrhagic Telangiectasis (Rendu-Osler) with Genealogic Table: Case. F. Raaschou.—p. 2743.
Hemolysis after Blood Transfusion with Compatible Blood. A. B. Hansen.—p. 2745.

Hereditary Hemorrhagic Telangiectasis. — Raaschou reports on a woman aged 46 who began at 15 to have nosebleed, which after 35 became aggravated in frequency and intensity. It is affected by effort, trauma, seasonal changes, the menses and the state of mind. During the last five years, the author says, multiple telangiectases have appeared on the tongue, lips and hands. Severe secondary anemia has occurred several times. During a more severe anemia in 1936 thrombopenia was established. The blood picture at present is normal, apart from a slightly lowered hemoglobin percentage; the bleeding time, according to Duke's method, is six minutes. Histologic examination of a hemangioma from the hand, of the size of a millet seed, showed a regular, strongly keratinizing covering plate epithelium of several layers and with normal structure; in the stratum papillare a number of empty lumens with endothelial lining were seen. At least eight of seventeen members of the family in the last four generations have had hemorrhagic telangiectasis. It appears in both sexes, with simple dominant inheritance. It is incurable, but the prognosis with regard to life is good.

Hygiea

*"Allergic" and "Allergizing" Rheumatic Diseases. G. Kahlmeter.—p. 2759.
*Diagnostic Significance of Basophil Leukocytes. H. Holmgren and G. Wohlfart.—p. 2771.
Tetany in Sprue Treated with Vitamin D in Intramuscular Injections. H. Hult.—p. 2774.

"Allergic" and "Allergizing" Rheumatic Diseases.—Kahlmeter designates acute rheumatism and chronic polyarthritis as probably "allergizing," not "allergic," disorders and on the basis of 115 cases describes three forms of "allergic" rheumatism: 1. Allergic polyarthritis or polytendinitis (75 instances, 55 in women) is, he says, characterized by transient edema, with sometimes intra-articular, sometimes intratendovaginal and sometimes periarticular localization, occurring at varying intervals and as a rule with short duration in each localization. The seat of the edema changes capriciously during the course of an attack. Between the attacks the patient is free from symptoms. Often other allergic symptoms are present, such as urticaria, Quincke's edema, asthma and migraine. 2. In intermittent or paroxysmal neuralgias with vasomotor symptoms (17 instances, 14 in women) there are attacks of sharp pain, localized in the cervical and in the brachial plexus, lasting from some hours to two days at the most, accompanied by paresthesias, vasoconstriction or diffuse edema and returning after variable intervals during which the patient feels perfectly well. These neuralgias are remarkably like attacks of migraine in duration and spacing and also in the effect of variations in meteorologic conditions, the psychic state and so on. As in group 1, other allergic symptoms may be present, such as migraine (in about half of the cases), urticaria and asthma. 3. Hydrops intermittens (23 instances in 10,000 cases of arthritis, 10 in women) is in its typical form a rare disorder. The attacks occur at regular intervals with regular duration and affect the same articulations. In all but 1 of the author's cases one or both knee joints were affected; in 3 cases the right and the left knee were affected alternately for a long time.

Diagnostic Significance of Basophil Leukocytes.—Holmgren and Wohlfart studied the number of basophil leukocytes in patients with different disorders by means of a specific staining method. They state that the number of mast cells seems to have diagnostic and sometimes perhaps prognostic significance. In chronic myeloid leukemia the mast cell count is almost regularly increased. In 5 cases 10 per cent or more was established. A mast cell value of from 4 to 5 per cent is almost pathognomonic for myeloid leukemia. In polycythemia there is a tendency to a slight increase in the number of mast cells, and during recent years transitions from polycythemia vera to myeloid leukemia have been noted.

Book Notices

Insect Pests. By Wm. Clunie Harvey, M.D., D.P.H., M.R.San.I., Medical Officer of Health, Borough of Southgate, and Harry Hill, M.R.San.I., A.M.I.S.E., M.S.I.A., Sanitary Inspector, Borough of Southgate. Cloth. Price, $4.25. Pp. 292, with 23 illustrations. Brooklyn: Chemical Publishing Company, Inc., 1941.

The control of insect pests is a problem which merits serious consideration at any time, but the present troubled international situation with its resulting altered living conditions and its movement of fighting and civilian forces has precipitated even closer attention to the problem. This volume is especially useful in that it presents the necessary practical considerations in handbook form. Although the manuscript was written in England, the subject matter is discussed in terms which are applicable to any country. Unnecessary detail is omitted, the authors having confined their remarks to the essentials required by the average department for insect control. Of the fourteen chapters in the volume, five relate to specific insect pests: general outlines of insect control, the bedbug, the flea, the louse and other insect pests. The last mentioned chapter discusses the cockroach, its relation to disease, habits, dissemination and control, the cricket, the silver-fish, the ant, the itch mite, psocids, the earwig, woodlice and the house fly. The remaining chapters deal with the principles and practice of disinfestation: building construction and infestation, gaseous fumigants, the technic of fumigation, insect control and educational measures, legislative control, human toxicology, disinfestation of foodstuffs and disinfestation of ships. The chapter on human toxicology discusses only hydrogen cyanide. The volume also has two appendixes, one presenting forms and records, the other specimen propaganda leaflets. The index is adequate for the contents of the book. Written in a style which permits easy and fast reading, the present volume should have a useful place as adjunct reading for all who are interested in the control of insect pests and in the prevention of disease. As the book is concerned only with insect pests commonly encountered around human dwellings, the reader must not expect to find discourses on special problems such as mosquito control.

Developmental Diagnosis: Normal and Abnormal Child Development. Clinical Methods and Practical Applications. By Arnold Gesell, M.D., and Catherine S. Amatruda, M.D. Cloth. Price, $6.50. Pp. 447, with illustrations. New York & London: Paul B. Hoeber, Inc., 1941.

This book aims to make the researches in normal mental growth during the first five years carried on over a period of twenty years at Yale University available and clinically useful to the pediatrician and the family physician. Numerous publications by Dr. Gesell and his co-workers have already recorded his extensive investigations into normal development of the young child, but this book summarizes and correlates the material for the clinician. The first part of the book offers a general survey of the early development of the child, including the norms of development up to the age of 3 years. The nature and conduct of the developmental examination of the young child are discussed. This first part of the book gives the substance of the authors' studies of the normal infant.

The second part of the book deals with defects and deviations of development. This is a most valuable section, which will be appreciated by physicians who tend to be baffled by problems of mental retardation. Differential diagnosis, in terms of the authors' use of the developmental quotient, is succinctly dealt with, and an etiologic classification of developmental defects and deviations is offered. Mental retardation, endocrine and convulsive disorders are discussed diagnostically. A chapter on special sensory handicaps is particularly informative. A discussion of clinical aspects of child adoption presents an excellent point of view with which all physicians should be familiar.

The final section, on protection of early child development, considers the use which the authors' diagnostic studies may be put to in furthering the proper early supervision of children and in guidance toward healthy physical and mental development. It is recommended that all medical students and youthful physicians read the small section entitled "Imparting a Diagnosis" (p. 312). Here some important mental health considerations in dealing with retarded children are stressed. Several appendixes give much detail of examination technic, charts showing growth trends, equipment required for developmental diagnosis and information on cinematic case studies.

This book may be warmly recommended to pediatricians and physicians. It offers comprehensive and well organized information about infants and children. The authors state specifically that they are chiefly concerned with the maturity and organization of the neuromotor system; with developmental neurology. This approach, most useful as it is, results in less emphasis on some psychologically and psychiatrically important aspects of child development. The intense focusing of interest on the conduct of the infant is not paralleled or supplemented by equally full consideration of his primary relationships with the mother and other members of the family. These considerations are not neglected in the book but are not sufficiently brought into focus to give as fully rounded a picture of the early development of the child as the rich material of the book might permit.

A word of caution also is in order. It would be easy to gain the impression that the use of the developmental schedules and the conduct of the developmental examination is a simple matter and that any physician without particular preparation might apply them in his office practice. As a matter of fact, if authentic use of Dr. Gesell's developmental norms is to be made, the physician should be carefully schooled and practiced in the conduct of the examination, and the greatest care and meticulousness exercised. Successful use of the examination, particularly for prognostic purposes, requires closest attention to very minor deviations in the infant's responses. The use of the refined tool Dr. Gesell has developed calls for skill and precision, and therefore training in its use. The volume is well printed, the language throughout is clear, simple and concise, and there are abundant photo tracings.

The United States of America, Appellants, vs. The American Medical Association, A Corporation; The Medical Society of the District of Columbia, A Corporation; The Harris County Medical Society, An Association, et al., Appellees. (A Reprint of the Official Documents with a Condensation of the Trial.) Cloth. Price, $5. Pp. 532, with illustrations. Chicago: American Medical Association, 1941.

This volume, bound in a durable green cover, contains a complete chronological review of the several steps in the criminal action instituted by the United States against the American Medical Association, the Medical Society of the District of Columbia, the Washington Academy of Surgery, the Harris County, Texas, Medical Society and twenty-one individual defendants, an action in which the defendants were charged with conspiring to violate the Sherman Antitrust Act in that they allegedly conspired unlawfully to interfere with Group Health Association, Inc., of the District of Columbia. The material contained in the book, all of which was previously published in THE JOURNAL, is presented in three groupings. In the first grouping, dealing with events occurring before the trial, will be found a verbatim copy of the statement released by Thurman Arnold, Assistant United States Attorney General, on Sunday, July 31, 1938, in which a grand jury investigation of the medical profession was forecast. This statement prompted widespread newspaper editorial comment, and following the Arnold statement in the book are reproduced many of such leading editorials. On October 17, 1938 a grand jury in the District of Columbia was impaneled, and an indictment was returned against all of the defendants on December 20 of that year. A copy of this indictment is reproduced on page xxiii. Beginning on page xxix is a chronological record of the events leading up to the indictment, followed by the opinion of Justice Proctor declaring the indictment invalid, the opinion of the United States Court of Appeals for the District of Columbia overruling Justice Proctor and reference to the ruling of the United States Supreme Court, in which a petition for a writ of certiorari filed by the defendants to review the action of the Court of Appeals was denied. Interspersed among the official documents are many pages of editorials from THE JOURNAL, newspaper editorials and cartoons, and photographs of the individual defendants and the attorneys for the government and for the defendants. On Wednesday, Feb. 5, 1941 the case came to trial on its merits and the second part of this book consists of a transcript of the record in the case, including the opening statements of counsel, the testimony of witnesses both for the government and for the defendants, copies of all motions made

and of the court rulings thereon, the closing arguments of counsel and the instructions given by the court to the jury. The third grouping comprises references to the verdict of the jury, in which the American Medical Association and the Medical Society of the District of Columbia were found guilty and the other defendants not guilty. The book ends with a report of the Board of Trustees to the House of Delegates, in which the Board recommended that counsel for the Association be directed to appeal the judgment that was rendered against the Association. The House of Delegates, without a dissenting vote, approved the report. Within the covers of this book, therefore, will be found a complete picture of the controversy extending over a period of more than three years. In no other place can the important happenings in this important case be found in so accessible a form. Many critical questions relating to the future of medicine in the United States are dependent for answers on the final judgment yet to be rendered in this case, questions that may affect the private practice of each and every physician and of each and every other professional man. Scattered through this book will be found set forth these questions with the answers suggested by the government and the answers suggested on behalf of the medical profession. The Supreme Court of the United States will undoubtedly be afforded an opportunity to say which answers are correct. The importance of the issues involved have prompted the publication of the book, and it should be in every physician's library. It should be available in every public library and in the library of every attorney or other professional man who is concerned with what the future may hold in store for the professions.

The Intervertebral Disc with Special Reference to Rupture of the Annulus Fibrosus with Herniation of the Nucleus Pulposus. By F. Keith Bradford, M.D., and R. Glen Spurling, M.D. Cloth. Price, $4. Pp. 158, with 45 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1941.

The amount of literature on the intervertebral disk and the nucleus pulposus has increased so tremendously during the past decade, and the diagnostic procedures and methods of therapy have varied so significantly, that the broad point of view of the authors in this monograph is extremely welcome. The embryology, anatomy, physiology and pathology are thoroughly described. The symptomatology, diagnosis and differential diagnosis and diagnostic methods are discussed in detail. In reviewing the literature the authors emphasize those conditions which are described and presented with a proved pathologic basis, while certain reports are mentioned but not accepted at face value. Phenomena which have been observed repeatedly have been given acceptance without known satisfactory explanation.

The authors stress the fact that the diagnosis of rupture of the annulus fibrosus with posterolateral herniation of the nucleus pulposus must not be undertaken lightly and that familiarity with other pathologic conditions with similar appearance is necessary. The description of the methodical clinical, roentgenologic and laboratory examination of patients with low back and sciatic pain bears favorable comment. The roentgenograms help to exclude lesions other than those due to pathologic conditions of the disk. The use of iodized oil is indicated only when the diagnosis cannot be made without it.

While it is true the presumptive clinical diagnosis of herniated nucleus pulposus can be made on the basis of back pain, with persistent or remitting sciatic pain and a positive sciatic nerve stretching test and hypesthesia and well localized paresthesia, or causalgia in the lateral aspect of the leg or in the foot, the differential diagnosis must be made from primary or metastatic neoplasm of the spine, cauda equina tumor, neoplasm of the prostate, rectum or pelvic viscera, spinal injury or anomaly, narrowing of the intervertebral foramina from other causes, hypertrophy of the ligamentum flavum, spondylolisthesis, syphilis, sciatic nerve injury, abscess secondary to bone suppuration, neurofibroma, peripheral tumor, herpes zoster, sciatic pain following gluteal injections, hypertrophic arthritis, aneurysm of the iliac or popliteal artery, glomus tumor, vascular disease and polyneuritis.

The authors emphasize the fact that low back disability from intervertebral disease without root pain is almost always an orthopedic problem. Conservative measures should be used in all acute cases. Laminectomy is indicated without contrast myelography if the symptoms persist and the subjective and objective appearances are characteristic. The technic of laminectomy at the various levels is described in detail. The postoperative care and end results are discussed. There is a short chapter on cervical and thoracic herniations and another chapter which includes some selected case reports.

This timely book is conservatively written and well illustrated. It has a fairly complete bibliography. It should be welcomed by all those who see or treat back pain and "sciatica," be they general practitioners, neurologists, neurosurgeons or orthopedic surgeons.

Arthritis in Modern Practice: The Diagnosis and Management of Rheumatic and Allied Conditions. By Otto Steinbrocker, B.S., M.D., Assistant Attending Physician and Chief, Arthritis Clinic, Bellevue Hospital, Fourth Medical Division, New York City. With Chapters on Painful Feet, Posture and Exercises, Splints and Supports, Manipulative Treatment and Operations and Surgical Procedures. By John G. Kuhns, A.B., M.D., F.A.C.S., Chief of the Orthopedic and Surgical Service, Robert Breck Brigham Hospital, Boston. Cloth. Price, $8. Pp. 606, with 321 illustrations. Philadelphia & London: W. B. Saunders Company, 1941.

This most recent of the monographs on arthritis is designed to embody in concise and practical form the commonly accepted diagnostic and therapeutic measures which are proving useful for arthritis but which are too new to have found a place in the textbooks. A good deal of judgment in employing any of them, as the author himself points out, is necessary, and, in the main, Dr. Steinbrocker has chosen well. Nevertheless, some procedures of a highly questionable nature have crept in, such as the recommendation for high colonic irrigation every two to four weeks. The chapter on local and regional analgesic injections is especially interesting. It is probable that the author goes further in his belief in the usefulness of such measures than do most workers in the field, but it is certainly a subject which deserves careful investigation. Analgesic injections are not without risk, however, and should be indulged in only by those who are thoroughly qualified by special study and training. The last five chapters of the book are written by Dr. J. G. Kuhns and deal with painful feet, posture and exercises, splints and supports, manipulative treatment, and operations and surgical procedures. These contain much practical information. The chapter on posture and exercises opens with a discussion on methods of grading posture and includes a reproduction of the Harvard chart of body mechanics, which grades posture on the basis of the silhouette. Although the chart is widely used, this method of grading is based largely on the degree of lordosis, and the entire question of lordosis in its relations to posture and "body mechanics" probably deserves complete reevaluation. In the way of minor criticisms, the references given at the end of each chapter are not readily legible because of the indentions; there are also some names misspelled in the bibliography. In spite of minor criticisms, this is a useful book and should serve as considerable assistance to physicians in the management of patients with the various common forms of arthritis.

America's Housekeeping Book. Compiled by New York Herald Tribune Home Institute. Cloth. Price, $2.50. Pp. 607, with illustrations. New York: Charles Scribner's Sons, 1941.

The vast amount of material collected by the New York Herald Tribune Home Institute is here made available in book form. Every housewife can find here innumerable useful hints on laundering, housecleaning, money management, repairing, operation and maintenance of the home, painting and, in fact, everything except cooking. The book, therefore, forms an essential companion book to the cook book in every kitchen.

Nobel Prize Winners: Charts—Indexes—Sketches. Compiled by Flora Kaplan. Second edition. Cloth. Price, $2.50. Pp. 144, with portrait. Chicago: Nobelle Publishing Company, 1941.

This is the second revised edition of a previous publication by the same author. Her first edition was sent to the Nobel Prize Foundation at Stockholm, Sweden, which made the necessary corrections and revisions. The present edition bears the marks of this improvement. The book is a most complete collection of biographic sketches and other information anywhere available on the recipients of the Nobel prize.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

FRACTURES, TRAUMA AND GLYCOSURIA

To the Editor:—**Shortly after a patient has suffered a fracture, he may show a slight glycosuria. Can you offer any explanation for this condition, and can you state whether or not my observation is consistent with that of others?** **N. H. Farrell, M.D., American Falls, Idaho.**

ANSWER.—Glycosuria frequently is found after a fracture. This observation rarely has any serious or medicolegal importance. What must be excluded, of course, is the presence of diabetes.

It has never been proved that ordinary trauma can cause diabetes mellitus. It is conceivable that the pancreas itself could be traumatized to such a degree as to produce diabetes, but actual instances are extremely rare. On the contrary, there are many instances in which severe trauma to the pancreas, with or without acute pancreatitis, has not produced diabetes mellitus.

There are several points worth mentioning: 1. Trauma often produces glycosuria, but this does not necessarily mean diabetes mellitus. It does mean that the diagnosis of diabetes mellitus must be excluded. 2. Trauma, either physical or psychic, may cause latent diabetes to be readily apparent. There are numerous instances in which a mild or latent diabetes is made severe by a fracture, an automobile accident or a sudden death in the family. 3. Trauma may increase the severity of diabetes. Herbert Pollack (The Influence of Bone Fracture on Insulin Requirements in Diabetes Mellitus, *Proc. Staff Meet., Mayo Clin.* **8**:423 [July 12] 1933) reported observations on 3 diabetic patients who sustained fractures. One of these patients may have had an undiagnosed fracture of the base of the skull. It should be mentioned that a fracture in this region may produce the diabetes described by Claude Bernard. 4. If trauma were responsible for the development of diabetes, then the extreme trauma produced by modern warfare should have caused an increase in the incidence of the disease among the combatants of the war of 1914 to 1918. Both E. P. Joslin (The Treatment of Diabetes Mellitus, ed. 6, Philadelphia, Lea & Febiger, 1937) and R. M. Wilder (Clinical Diabetes Mellitus and Hyperinsulinism, Philadelphia, W. B. Saunders Company, 1940) recorded that this was not the case; more cases of diabetes were found among noncombatants than among combatants.

SOLUTIONS OF SODIUM SULFATHIAZOLE IN NOSE

To the Editor:—**Recently there was an article in *The Journal*, April 26, 1941, page 1899, on the successful treatment of sinusitis with nasal sprays of 5 per cent solution of sodium sulfathiazole. Before and since, there have been published positive statements that it should be used only intravenously, as any spilled outside the vein causes necrosis. In a personal conversation which I held with the head chemist of a large drug manufacturing company, the chemist stated positively that a solution of sulfathiazole exposed to light begins to decompose after forty-eight hours and becomes irritating as well as loses its chemotherapeutic effect. He stated that it is not safe to use intranasally as a spray after several days. If it is destructive to tissue, must it not destroy the delicate intranasal cilia when sprayed in? If the drug is so used continuously for some time, the most powerful protective function against infection of the nose would ultimately be destroyed, as in cases of ozena or advanced chronic atrophy. Has any research work been done to determine the effect of sulfathiazole on viable cilia?**

A. C. Howe, M.D., Brooklyn.

ANSWER.—A 5 per cent solution in distilled water of sulfathiazole sodium sesquihydrate has a p_H of between 10 and 11, and when such a solution is injected into the tissues it has a definitely irritating effect and under certain conditions will produce necrosis of the tissues with slough. However, when such a solution is used as a spray in the nose or the throat there is a rapid dilution of the original solution, together with a decrease in its alkalinity due to the buffering action of the nasal mucus and saliva, so that the chance of irritating effects being produced is decreased. When a 5 per cent solution is used as a spray at frequent intervals, patients may complain of a sensation of heat and burning in the area to which the spray of the solution of sodium sulfathiazole has been applied. Fletcher (*California & West. Med.* **55**:94 [Aug.] 1941) has reported that necrosis of the lining of the maxillary sinus occurred after irrigations of the sinus with solutions of sodium sulfathiazole for three weeks. Solutions of the sodium salt of sulfathiazole may decompose if exposed to light over several days. For this reason when sprays of sodium sulfathiazole solution are being employed the prescription should be written for a two days' supply in order that a decomposed solution is not used by the patient. As far as is known at present, there have been no studies conducted on the effect of sprays of sodium sulfathiazole on the cilia of the nasal passages. Certainly it would seem that injury might come to the cilia if highly alkaline solutions were employed, but it is possible (and this is solely a matter of opinion) that the dilution and buffering effects of the nasal mucus are such that the cilia are not affected. A final conclusion on this point cannot be reached at present because of the lack of experimental work. Until the results of such investigations are available, it would seem that a considerable degree of caution should be used in the application of alkaline solutions of sodium sulfathiazole to the nasal mucous membrane.

ARM AND LEG PAINS IN BOY

To the Editor:—**About ten months ago a boy aged 8 years had nasal obstruction, frequent sneezing and vague aches and pains about the arms and legs. On examination, he was found to be 3 pounds (1.3 Kg.) underweight and exceptionally sensitive to ragweed pollen and to have mild secondary anemia. The heart and lungs were normal and the liver and spleen not enlarged. He was given specific therapy to combat the hay fever and anemia; at present he has gained 10 pounds (4.5 Kg.) and is free from the nasal allergy. However, the pains in the upper and lower extremities have become more intense, and sedation is required to make him comfortable. These pains come on when it is about to rain or snow. The boy is not affected by swimming in cold water or exposure to dry cold, but atmospheric changes seem to predispose to these attacks of pain. At no time have the joints or extremities been swollen, tender or limited in motion. The sedimentation rate is normal. The blood calcium content is 11 mg. per hundred cubic centimeters, the phosphorus 4.6 and the nonprotein nitrogen 37 mg. The blood pressure is 98 systolic and 68 diastolic. A roentgenogram of the long bones shows mild, diffuse osteoporosis. Repeated examinations of the urine have given negative results. The mother is fearful that the child has "rheumatism" which may eventually lead to crippling heart disease. What conditions would give pain in the extremities associated with atmospheric changes? What form of relief would you suggest?** **M.D., New York.**

ANSWER.—This boy has a peculiar clinical picture and has already been well studied from a physical and laboratory standpoint. The following conditions come to mind, most of which have already been fairly well eliminated by the data presented: hyperparathyroidism, chronic polyarthritis (Still's disease), myalgia, growing pains, rheumatic fever, neurosis, neuritis (lead poisoning, beriberi), scurvy, muscular dystrophy, sickle cell anemia (if the patient is a Negro), myositis, trichinosis, and physical allergy.

The four most likely differentials would involve rheumatic fever, growing pains, physical allergy and neurosis.

Growing pains occur at the end of the day, especially during the night, and the pain is gone in the morning and usually does not recur during the day. They appear most commonly in the muscles of the legs and thighs, appear rarely in the upper extremities and are frequently worse in the summer, when children are more active. There are no objective signs or other evidence of rheumatic fever. The sedimentation rate, leukocyte count and hemoglobin content should be normal.

In patients with rheumatic fever the pain and stiffness occur when getting out of bed in the morning and during the entire day, especially on motion, often causing a limp. The patient feels better on getting warm in bed. The joints rather than the muscles are particularly involved in both the upper and the lower extremities. There are usually bouts of joint pains, nosebleeds, cutaneous rashes, pallor and fever. There is almost always during the acute painful stage an increased sedimentation rate, some fever, some anemia and a mild increase in leukocytes.

Physical allergy must be considered, as the child mentioned is allergic. This particular group of symptoms has not been described, but it is conceivable that damp weather—increased humidity and low barometric pressure—could cause some sort of physical allergy resulting in muscular spasm and pain. It would be difficult to prove this. However, if epinephrine or ephedrine in proper doses relieved the symptoms the relief would be suggestive.

In a child of 8 years a neurosis must always be considered, the complaints being an attempt to attract attention or gain some end. However, other behavior difficulties would be present in a child poorly adjusted emotionally, and no mention is made of maladjustment in the history.

The osteoporosis of the long bones should be followed by occasional roentgenograms, as the child might have an incipient parathyroid disturbance.

BACTERIA AND SPIROCHETES IN THE STOMACH

To the Editor:—A white man aged 33 complains of morning nausea and gaseous eructation and anorexia. On examination of the gastric content 40 degrees of free acid was found and 50 degrees of total acid. This was thirty minutes after 7 per cent alcohol. It was noted that the gastric content had a foul odor and simulated that of fusospirochetal abscess. On examination of the gastric sediment numerous pus cells, particularly monocytic cells, and a great many fusiform bacilli and spirochetes were found. I was unable to find any spirochetes in smears from the mouth or throat. Roentgen examination of the chest and stomach revealed no abnormalities. The patient was given 0.3 Gm. of neoarsphenamine twice weekly for four doses, and following this he has gained considerably in weight and feels better. There was a severe reaction after each injection. Now he is taking nothing, but the gastric content continues to have the same foul odor and the same findings in the sediment. I should like to know the frequency of such a finding and also the therapy.

M.D., South Carolina.

ANSWER.—Fusiform bacilli and spirochetes may be found in the mouth and stomach contents of healthy persons. Large numbers of these organisms may also be found in the gastric contents of patients with achlorhydria, particularly in those with pernicious anemia (Dick). The significance of this finding is not known, but ulcerative lesions of the gastric mucosa are not commonly found in pernicious anemia.

Bacteria are swallowed almost constantly, including those from infections in the mouth and the respiratory tract. Examination of the gastric sediment may therefore be expected to disclose a large number and variety of bacteria, not infrequently including pathogenic organisms. Whether or not these bacteria remain viable for more than a few minutes is thought to depend almost entirely on the acidity of the gastric contents. In the presence of free acid (p_H value of 3 or less) the stomach contents are bactericidal and when cultured are almost always sterile. In the acid secreting stomach there may normally be periods of hours each day when the gastric contents are not sufficiently acid to be bactericidal. If pathogenic bacteria are swallowed during such a period, it is conceivable that they might invade the gastric mucosa and subsequently give rise to an inflammatory lesion. The frequency of such an occurrence is not known. The available evidence would seem to indicate, however, that for some reason as yet not clearly understood the gastric mucosa is resistant to infection. With regard to the etiology of chronic nonspecific gastritis, Schindler states that practically nothing is known but "it seems that bacteriological factors play a minor role as compared with mechanical and chemical factors."

The cytology of the gastric contents has been studied by several investigators. The average cell count in the normal subjects studied by Mulrooney was found to be 232 per cubic millimeter: 16 per cent were leukocytes and 84 per cent were epithelial cells. In cases of gastritis an increase in the total cell count was found together with a relative increase in the leukocytes. The significance of leukocytes in the gastric contents would therefore seem to depend entirely on the number of leukocytes present.

In view of these considerations, additional information is necessary to evaluate the findings in the case cited and to institute appropriate therapy. Gastroscopy should readily disclose whether or not an ulcerative and suppurative gastric lesion is present. Cultures of the saliva should indicate whether fusiform bacilli and spirochetes are being swallowed and, if so, their relative number.

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EFFECT OF DRUGS ON INTESTINAL p_H

To the Editor:—Are there any drugs, other than hydrochloric acid, which will tend to acidify the intestinal tract or at least reduce the alkalinity of it? Would sodium acid phosphate or ammonium chloride have the same effect on the gastrointestinal acidity as they do on the urinary acidity?

G. Perry Ross, M.D., Auburn, N. Y.

ANSWER.—The effect of various drugs on the reaction of intestinal contents (except in the duodenum) has not been thoroughly investigated. It is doubtful, however, that ammonium chloride, sodium acid phosphate, other acid salts or acids administered in therapeutically possible doses alter the p_H of the intestinal contents long enough to be of practical significance. Certainly the effect is not comparable to that on the p_H of urine. Dilution, neutralization and rapid absorption, among other factors, tend to prevent an appreciable concentration of such drugs in the bowel.

When the stomach secretes acid, considerable variation in the p_H of intestinal contents may occur, although the reaction below the duodenum is usually alkaline to slightly acid, with a tendency for the contents to be alkaline lower in the bowel.

Whether the intestinal contents are constantly alkaline in the presence of achlorhydria is not definitely known. In view of the fact that a normal person has been estimated to secrete approximately 1,500 cc. of acid gastric juice daily, however, replacement therapy does not seem to be practical. Furthermore, there is no conclusive evidence to indicate that such therapy would be sufficiently beneficial to warrant its use.

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BODY SWELLINGS PRECIPITATED BY PRESSURE

To the Editor:—A married woman aged 32 has been complaining of constantly recurring itchy, at times red, welts over various parts of the body. They occurred at first just before menstruation but they occur now any time during the menstrual cycle. Pressure of some sort seems to be the provoking and precipitating cause. Thus a tight belt around the waist, pressure of strap of a golf bag over the shoulder, tight shoes across the dorsum of the foot, leaning a long time on the tips of the elbows or sitting a long time on a hard surface will cause the manifestation of a welt from 1 inch to 3 inches in diameter over the area of the body subjected to the pressure. There is a history of allergy in the family. Otherwise the history by systems, the past medical history and the family and social histories are negative. The blood Wassermann reaction is negative; a catheterized specimen of urine was negative on analysis; blood counts revealed mild secondary anemia. The basal metabolic rate was minus 12 and minus 18 per cent. The treatment consisted of large doses of calcium, thyroid, desensitization with histamine hydrochloride, administration of histaminase, large doses of vitamins, ephedrine and amytal, adrenal cortex extract and ascorbic acid. Is there any other form of treatment which might possibly be tried to help her? The condition has improved somewhat; that is, the welts are not so large, itchy and frequent as formerly, but much room for improvement remains.

M.D., Milwaukee.

ANSWER.—The diagnosis in this case is not at all clear. The fact that pressure precipitates the swellings leads to the diagnosis of physical allergy due to pressure, the treatment of which is unsatisfactory. Pressure should, of course, be avoided as much as possible. The fact that it occurs at menstruation would suggest some ovarian disorder. Possibly the patient is allergic to certain foods, and menstruation acts merely as a contributory factor. The patient should avoid for a trial period foods which commonly cause urticaria, such as fresh vegetables, fresh fruits, chocolate, tomatoes, peas, beans, fish, "cola" drinks, nuts and pork, including ham, bacon and lard.

THE CHEDIAK SERODIAGNOSTIC TEST FOR SYPHILIS

To the Editor:—A serodiagnostic test for syphilis described by Chediak of Habana has recently been brought to my attention. This is a microagglutination reaction based on the use of one drop of dried blood, and the result can be read within a few minutes. The method is extremely simple, and the author claims greater accuracy than is to be had with the Wassermann, Kahn, Meinicke and other tests. The advantages of such a simplified test for syphilis are obvious. Although seventy-five references are quoted by Chediak as appearing in the Cuban, Spanish, South American, French, German and Italian literature and regarding the use of his reaction, there is not one American or English article quoted on it. As facilities for investigating the literature at this station are nonexistent, I should like information on the accuracy and reliability of this reaction. It appears to me strange indeed that, if this test is accurate, physicians in the United States are really missing a simple and readily available test for syphilis.

Emil Granet, M.D., Lieut., M. C., U. S. N. R., Guantanamo Bay, Cuba.

ANSWER.—It is apparently true that the Chediak microtest for syphilis has not been discussed in the medical literature of this country. The *Quarterly Cumulative Index Medicus* from 1936 on does not list any English references to the test, although it does list references in other languages. The reason is probably that serologists in this country prefer the use of serologic tests which have been evaluated by the American Evaluation Committee on Serodiagnostic Tests. It is understood that the Chediak reaction will be evaluated with other serologic methods in a forthcoming study to be conducted by the U. S. Public Health Service.

To secure the Chediak reaction, which is a modification of the Meinicke microreaction, a drop of defibrinated blood is permitted to dry on a slide. The dried drop is dissolved by a mixture of sodium chloride and sodium bicarbonate solution. An antigen similar to that of Meinicke is added: the slide is agitated for three minutes and is then placed in a moist chamber for thirty minutes. The results are read microscopically. A description of the Chediak reaction with a review of the literature is contained in a recent volume: Vogelsang, T. M.: Sero-Diagnostic de la Syphilis, Bergen, Norway, J. W. Eides Boktryckeri, 1940.